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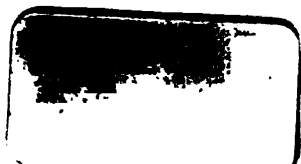
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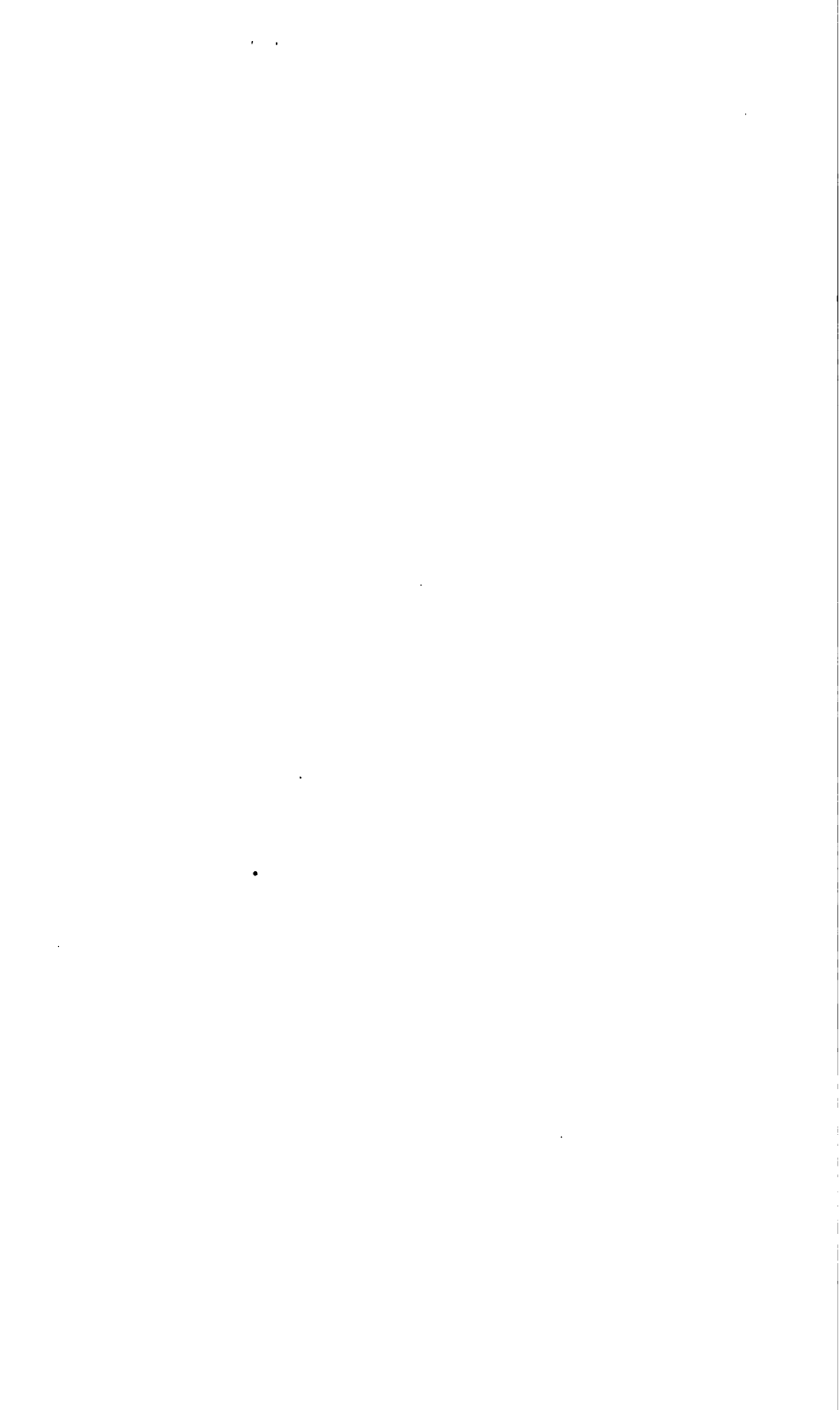
AND
DISEASES OF WOMEN AND CHILDREN

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VOLUME LIII.
JANUARY-JUNE, 1906

NEW YORK
WILLIAM WOOD & COMPANY
1906



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THE AMERICAN JOURNAL OF OBSTETRICS

AND DISEASES OF WOMEN AND CHILDREN.

VOL. LIII.

JANUARY, 1906.

NO. 1.

ORIGINAL COMMUNICATIONS.

METRORRHAGIA MYOPATHICA.

BY

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(With 24 cuts and four plates.)

METRORRHAGIA myopathica is a form of uterine hemorrhage, which is independent of the usual causes of metrorrhagia,* and is produced by a pathologic condition of the uterine muscle.

The word metrorrhagia represents a symptom only and carries with it no indication of the underlying lesion. Metrorrhagia myopathica is that form of metrorrhagia which depends upon an abnormal state of the uterine musculature.

This symptom usually manifests itself toward the close of the child-bearing period. At that time excessive menstrual flow or uterine hemorrhage between the periods, in the absence

*The usual causes of menorrhagia or metrorrhagia are given by Jakesch as follows:

Local.—Endometritis chronica fungosa, polyps, fibromyomata, ovarian tumors (while small).

General.—Chronic nephritis, heart disease, cirrhosis of liver, typhoid, cholera, variola, scarlatina, influenza, acute articular rheumatism, hemophilia, scurvy, syphilis (secondary and tertiary), chlorosis.

To these may be added carcinoma, sarcoma, adenomyoma, pregnancy, cystic endometritis.

of the accepted causes of this abnormality, often remains an enigma. If, in a given case, there is no new growth of any kind; if pregnancy can be excluded; if there is no adnexal visceral or general complication; if, in short, none of the usual causes of metrorrhagia obtain, the condition is, as a rule, regarded as obscure and variously relegated to the domain of apoplexia uteri, endometritis senilis, preclimacteric bleeding, etc., etc. These terms are often loosely applied. Apoplexia uteri presupposes arteriosclerotic changes in the uterine arteries, with an actual rupture of one of these unhealthy vessels. Such a condition I have not observed in upwards of 300 uteri, examined grossly and histologically, in the laboratory of the Gynecological Department of the University of Pennsylvania, and in the laboratory of the Kensington Hospital for Women. Consequently, this apoplexia uteri, if it ever occurs, must be extremely rare. What rôle arteriosclerosis of the uterine vessels plays in uterine hemorrhage is yet to be decided. Reinecke says that it alone cannot account for persistent metrorrhagia, and notes cases in which there was no metrorrhagia, and yet the vessels showed arteriosclerotic changes. As will be observed from my own cases, arteriosclerosis in the uterus has not the significance it takes elsewhere. In the uterus, arteriosclerosis is the result of the development and subsequent involution of the blood vessels, indelibly associated with pregnancy and the puerperium. It occurs normally in every parous uterus, and may have no more pathologic import than has the general arteriosclerosis of the aged. This point will be referred to again.

Endometritis senilis is another term under which these myopathic metrorrhagia cases are grouped. Dunning has recently written extensively upon this subject. In Dunning's cases there was hypertrophy of the mucosa, arteriosclerotic changes in the blood vessels, and a disseminated myxomatous degeneration of the muscularis. None of these conditions warrants the title endometritis senilis. There is no lesion of the endometrium characteristic of age but atrophy, and this is normal. There is as much propriety in speaking of endometritis adolescens as of endometritis senilis; for endometritis may occur at any age, and such terms convey no suggestion of the actual morphologic condition. As will be shown later, arteriosclerotic changes occur in every parous uterus. The mucoid degeneration reported by Dunning might have considerable import, if it were found constantly in metrorrhagia

cases of this sort. At any rate, the symptoms in Dunning's cases were due either to cystic glandular endometritis or to some disease of the muscularis; in either event endometritis senilis is an inappropriate title.

Preclimacteric bleeding is a specious name given to cases of metrorrhagia myopathica, which conveys no meaning but the period of life at which the hemorrhage occurs.

It is plain, from the existence of these terms, that there is a class of cases which are not very well understood, and are conveniently but falsely classified. This class I have designated by their chief symptom as cases of metrorrhagia myopathica, believing that the cause lies in the uterine muscle, whether it be an actual primary disease of the part itself, or a secondary lesion, the result of a general condition.

What is the nature of the pathologic process in the wall of the uterus? Arteriosclerosis of the uterine vessels was, in the past, considered to be a sufficient cause. At the present time this view is not generally accepted. Theilhaber and Meir believe that a fibrosis of the uterine musculature leads to metrorrhagia; in other words, from a disproportion between its muscular and its connective tissue constituents the uterus loses its contractile power, and this results in congestion and hemorrhage.

Several years ago Pick published a paper, in which he described minutely the elastic fibers of the uterine muscle and of the uterine blood vessels. He found that the elastic tissue varies in its amount and in its form at different periods of life and in different diseases. It occurred to me that, as this tissue played such a large part in the pathology of arteriosclerosis and of the vascular system in general, it would be worth while to investigate the elastic tissue in the uteri of women the subjects of metrorrhagia myopathica.

I have studied the elastica in 18 uteri taken from women at different periods of life and compared them with the five clinical cases of metrorrhagia myopathica which have come under my observation.

In order to present clearly what there is to be said, it will be necessary to briefly review the anatomy and physiology of the uterus, so far as it bears upon this subject.

ANATOMY.

Uterine Muscle.—The arrangement of the muscle bundles of the uterine wall has been the object of many painstaking in-

vestigations. It is exceedingly difficult to detect any very well marked division into layers as most of the muscle bundles run indiscriminately here and there among themselves. At least this is true in the vascular layer of the myometrium



Fig. 1. Transverse section through entire wall of nulliparous uterus at the fundus. Hematoxylin Eosin. Stratum subserosum (s. s.). Stratum supravasculare (s. s. v.). Stratum vasculare (s. v.). Stratum submucosum (s. s. m.). Endometrium (E.).

where the interlacing bundles of muscle surround the vascular branches, upon whose calibre they are therefore able to exert a very powerful influence. Kreitzer described four layers of muscle in the uterine wall. Stöhr speaks of three. The dif-

ference depends upon the degree of differentiation. If Kreitzer's classification is accepted, there is first the layer containing the large blood vessels already mentioned, spoken of as the *stratum vasculare* (Fig. 1); running between this and the mucosa is a layer whose general direction is longitudinal, spoken of as the *stratum submucosum*.

An outer layer, running longitudinally directly under the serous coat, is given the name *stratum subserosum*. The irregular fibres between the latter strata and the vascular layer are known as the *stratum supravasculare*. The greater part of the uterine wall, however, is made up of the vascular layer. The muscle of the uterus is of the non-striated type, intimately bound together by connective tissue, which is directly continuous with the adventitia of the vessels.

ELASTIC TISSUE.

The elastic fibers of the uterus have a definite arrangement; according to Pick they have two main sources. They originate from the elastic tissue in the serous covering of the uterus and from the elastic tissue in the coats of the blood vessels. They are very rich in the subserous and supravascular layer (Fig. 23), through which they run, in a direction generally at right angles to the muscle bundles; *i. e.*, the outer or subserous layer being longitudinal and the supravascular layer being circular, the main stems of elastic tissue run from the serous covering of the uterus in a centripetal direction toward the endometrium. In the vascular layer the elastica is mainly derived from the vessels and follows the ramification of the connective tissue in which it runs (Figs. 3 and 4). Exclusive of that immediately surrounding the vascular channels the amount of elastic tissue grows progressively less from the serous to the submucous coat, where there is practically none. Elastic tissue is recognized by staining with Weigert's resorcin-fuchsin stain; it appears in the form of wavy black fibers, which vary in thickness; they normally present an unbroken course, branching and rebranching until the finest subdivisions in the subserous layer surround the individual muscle cells and form elastic perimysia.*

*The arrangement of the elastic fibers in the cervix has been studied by Dührsen. It is unnecessary to mention his paper with any detail as the conclusions he draws deal largely with the part the cervix plays in labor.

Pick draws attention to the arrangement of elastic tissue in the uterus as being highly significant. The preponderance of the fibrils in the subserous and supravascular layers, their definite direction (centripetal) towards the endometrial cavity, their fine subdivision so that in the outer layer they surround each individual muscle cell, all of this he believes shows they have a very well defined purpose. They serve not only for the support of the blood and lymph capillaries and the nerves, but further than this they reinforce the muscular action of the uterus, protect it from being overstretched and make easier its return to a passive state after either distention or contraction.

Blood Vessels of the Uterus.—*Werth* and *Grusdew* have called attention to the vessels of the uterine wall, which are peculiar in several respects.

The larger venous branches in adult organs have a muscular wall, which runs longitudinally (Figs. 3, 10, and 11), and corresponds in its direction to the axis of the vessel. The smaller venous channels have a very narrow or no particular wall, appearing simply as spaces separated from the musculature by a narrow layer of connective tissue.

The arteries are distinguished by the greater breadth and consistency of their adventitia (Figs. 3 and 7). The adventitia of the larger arteries of the vascular layer contain longitudinal muscle bundles.

According to *Werth* and *Grusdew* the vascular branches of the inner part of the myometrium run directly towards the endometrium (Fig. 2). After entering the deeper portions of the mucosa the endometrial arteries give off fine, relatively large, branches, which penetrate to the neighborhood of a capillary plexus (subepithelial capillary plexus) found beneath the surface epithelium. Other smaller branches pass to the glands (Fig. 2). Large venous branches lead from the subepithelial capillary plexus directly to the veins in the depths of the mucosa. There are also tributaries carrying back the blood from the capillary network directly surrounding the glands. The elastic fibres found in the vessels themselves conform to the general distribution of elastica in veins and arteries elsewhere.

PHYSIOLOGY.

The finer physiology of the uterus embraces the changes incident to puberty, menstruation, child-birth, the puerperium

and the menopause. Physiologically, the female generative organs, especially the uterus and the ovaries, are peculiar in this that they develop activity later than any other organ of the body, dominate in a measure all other organs for a while, and then cease their activity at a time considerably before the effects of age are noted in other parts. The changes incident to the various periods in normal uterine activity are

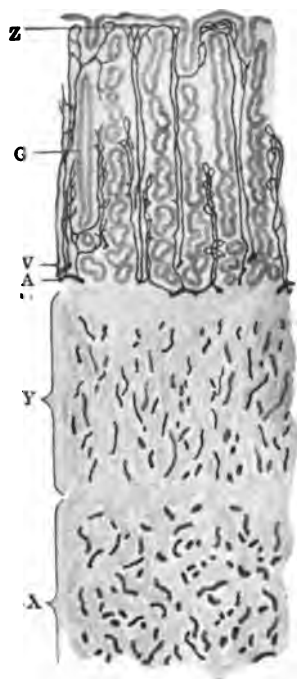


Fig. 2. Diagrammatic scheme to illustrate vascular channels of uterine wall and endometrium. Tortuous vessels of the vascular layer (X.). Centripetal vessels of the submucosa (Y.). Subepithelial capillary plexus (Z.). Arteries (A.). Veins (V.). Glands (G.).

appreciable through anatomical alterations and these affect the several constituents of the uterine wall, which have already been described.

Before the age of puberty, the uterus is functionless. At puberty there begins a development of the uterine muscle. While up to that time, according to Theilhaber and Meir, but one-third of the uterine bulk is muscular tissue, the latter increases

rapidly at puberty, and up to the age of 20, when the muscular elements constitute fully two-thirds of the entire bulk. There is a similar increase in elastic elements and in the vascular supply, which brings the anatomy of the uterus up to that already given of the healthy nulliparous uterus during the child-bearing period.

During pregnancy all of the structures of the uterine wall undergo hypertrophy. The elastic fibers, together with the other uterine tissues, increase up to the fourth month.

During the latter part of pregnancy, the elastic tissue diminishes, but this diminution is more apparent than real, and results from the stretching of the uterine wall.

The elastic fibers, however, increase considerably in the paracervical tissue during pregnancy, and this, it has been assumed, is a provision of nature for the dilatation of the lower uterine segment during labor. During the puerperium, when all of the hypertrophied and hyperplastic elements of the uterus undergo involution, there is an actual increase in the number of elastic fibers, which is sufficient to brand the parous from the nulliparous uterus. (Compare Fig. 3 with Fig. 4, and Fig. 23 with Fig. 24.) Theilhaber and Meir assert the same of the connective tissue—viz., that while after pregnancy the entire uterus undergoes involution, this affects the muscular more than the connective tissue elements and results in an increase of the latter at the expense of the former.

Pregnancy has an actual well-marked effect upon the vascular channels of the uterus.

Pick and Woltke have each described changes in the intima of the vessels of the vascular layer of the uterus, which occur during the puerperium.

There is a peculiar thickening of the intima causing it to project irregularly into the lumen of the vessel (Figs. 12 and 13). This appearance they ascribe to the organization of peripheral clots. The thickened part is made up of tender elastic fibers, growing connective tissue cells and leucocytes. A slight permanent thickening of the intima is the result. These authors have also noted a general increase of elastic tissue throughout the uterine wall as a consequence of pregnancy and parturition. After the menopause the uterine vessels become diminished in caliber from a thickening of their walls; the vessels show more or less arteriosclerotic changes and have a tendency to approach one another to form groups. There is a great increase

of elastic tissue about these groups, but the elastic fibers are mostly isolated in this position and the islands of degenerating vessels and elastic tissue scarcely communicate with one another, so that aside from the vascular islands, there is little elastic tissue in the vascular layer. In the external layers of the uterus there is also a considerable increase of the elastic tissue. This change in the proportion of elastic tissue of the uterine wall is compared by Melnikow-Raswendenkow to similar changes occurring in parenchymatous organs, *e. g.*, in the kidney, liver, heart, spleen, etc., as the result of age. *He believes that the elastica takes the place of atrophied parenchyma, be it epithelial or muscular, and furthers the mechanical internal equilibrium of the organ. Wherever, he says, by the atrophy of parenchymatous structures there is a disturbance in the dynamics of secretion and excretion the vis a tergo is supplied by the new formed elastic tissue.*

That this preservation of uterine tone is necessary during menstrual life and that the increase of elastic tissue which accompanies the diminution of the muscle elements is a provision of nature cannot be gainsaid. The contractile power of the uterus plays an important part in the phenomena of menstruation as it does in any hemorrhage from the uterus. The powerful influence which uterine contraction has upon hemorrhage from the uterine interior is seen at the close of labor. In normal menstruation the endometrium plays a passive part. There is no actual rupture of the endometrial vessels, but a diapedesis of the menstrual fluid through the thin-walled capillaries of the subepithelial capillary network. The fluid accumulates beneath the epithelium of the endometrium and gradually finds an exit between the epithelial cells or through breaches in the epithelial layer. As this is almost entirely a passive process it follows that the quantity of the menstrual flow is in direct relation to the blood pressure within the endometrial capillaries. The endometrial blood pressure in turn depends upon the force of the arterial supply and the calibre of the venous channels of return. As the arteries have firmer and better defined walls than the veins, they are therefore less compressible, and slight contractions of the uterus, which occur at the menstrual periods, would narrow the venous but have little influence upon the arterial channels. In this way there would be a sufficient disproportion between the inward and the outward flow to produce congestion of the endometrial vessels and a resulting

diapedesis. This is entirely in accord with the conclusions of Clark, who found that unless a myoma actually encroached upon and eroded the mucosa, the hemorrhage attending these tumors was due entirely to disturbances in the return circulation.

It is natural then, at the close of menstrual life, that the muscular elements having no further use should undergo atrophy and that the intravascular area of the organ should be diminished by sclerotic changes in the blood-vessel walls, and that this should be furthered, as it is in other organs, by an increase of elastic tissue which helps contract the vessels and takes the place of lost parenchyma. It is easy to see, therefore, that a failure in the normal increase of elastic tissue or a failure in the normal oblitative changes of the vascular channels, or an excessive atrophy of the muscular elements or an excessive hypertrophy of connective tissue (making firm contraction of the uterus and compression of the blood-vessels more or less faulty) might result in disturbances of the endometrial circulation and produce profuse menorrhagia or metrorrhagia.

At the University Hospital in the gynecological service of Dr. Clark, there have been a number of cases of uncontrollable metrorrhagia. But three of these after careful study can be spoken of positively as metrorrhagia myopathica. In the remaining cases conditions were found after operation which might explain the trouble upon other grounds and consequently they could not be properly regarded as myopathic. In two myopathic cases the amount of alteration in the elastica of the blood vessels and the outer layers of the uterine wall was not in proportion to the parity of the specimen. Thus in one case the woman had had ten children and three miscarriages; in the other two children and one miscarriage. To estimate the importance of the anatomical changes in these cases, I have studied in addition a large number of sections.

As in every investigation of this sort, physiological changes are to be first recognized. Eighteen uteri were selected which had been removed at operation, from patients ranging in age from 17 to 56 years, and in parity from nulli- to decipara. Uteri containing new growths (carcinoma, sarcoma or fibroid tumors) were not employed. If it had been possible, autopsy specimens only would have been used. There is difficulty in securing them, and I was obliged to make use of uteri removed with the adnexa in operations for pelvic inflammatory disease. The uterus in these cases is often unaffected as far as

the musculature is concerned, and they were accordingly deemed suitable for my purpose.

Preparation of Sections.—The specimens were fixed in formalin 4 per cent., and hardened in alcohol. Either of these agents are suitable for sections to be stained by Weigert's or Van Gieson's method. After opening the uterus uniformly in each case through the anterior wall, a wedge of tissue was removed below the level of the round ligament to the left of the incision. This was made to include the entire thickness of the myometrium and endometrium, and was cut at right angles to the long axis of the uterus. A second wedge was cut from the lateral wall of the cervix, just at the point of section (in supravaginal hysterectomy) or at the internal os (in panhysterectomy), including the adjacent parametrium.

This tissue was embedded in celloidin and mounted upon vulcanite blocks; sections of a uniform thickness of 30 m. were cut from each block and stored in 80 per cent. alcohol.

Thinner sections were desirable, but it was found impossible to obtain an average for the entire series, less than 30 m. Where it was expedient, serial sections of 10 m. were made. A large number of trial sections were stained by Weigert's and by Van Gieson's method, in order to determine the exact technique for accomplishing the best results—that is to say, to bring out most perfectly the elastic, muscular and fibrous tissue. It was found that the sections stained by Weigert's stain alone, without any counter stain, exhibited best the elastic tissue, which appears intensely black in a homogenous field. For differentiating the fibrous and muscular tissue, Van Gieson's stain, without any preparatory treatment by means of hematoxylin was used. This brings out very clearly the fibrous tissue as a brilliant red and the muscle as a deep yellow.

In preparing the permanent specimens for histologic examination, sections from each block were stained by Van Gieson's,* by Weigert's† and by the ordinary hematoxylin-eosin methods; the technique in each case was identical.

The sections were examined with the naked eye, lying flat upon a white surface and held up to the light, and upon the stage of the microscope at a magnification of 130 and 650 diameters.

To secure accuracy in the comparison of the same slide stained by the three different methods, sketches of important fields were made by means of a camera lucida.

*Van Gieson's method. Van Gieson's stain: Saturated watery solution of picric acid, 10 parts; one per cent. watery solution of acid fuchsin, one part. This solution was freshly prepared each time; the proportions were accurately measured with a pipette. After floating the section in water it was immersed in Van Gieson's stain 3 min.; water, 10 sec.; 95 per cent. alcohol, 1 min.; absolute alcohol, 2 min.; cleared in carbol-xylol and mounted in Canada balsam.

†Weigert's resorcin-fuchsin method. Weigert's resorcin-fuchsin stain: Fifty c.c. of a 2 per cent. watery solution of resorcin and 50 c.c. of a 1 per cent. watery solution of fuchsin (not acid fuchsin) are placed together in a porcelain dish over a Bunsen burner. After actual boiling has started 6½ c.c. of Liq. Ferri. Sesquichlor. U. S. P. are added and the mixture is boiled for 3 to 5 minutes longer. After cooling, the mixture is filtered. The filtrate is thrown away. After all the water has evaporated from the residue on the filter paper, the latter is placed in the porcelain dish first used (which has not been cleaned, and contains some of the dried precipitate of the first mixture) with 50 c.c. of 95 per cent. alcohol. This is placed over the gas flame and boiled. After the alcohol has dissolved, the residue from the filter paper, the latter is fished out of the solution. The solution is allowed to cool and is then filtered. The filtrate is brought up to 50 c.c. with fresh 95 per cent. alcohol and 4 c.c. of hydrochloric acid (c.p.) are added. Sections were stained by placing them in Weigert's resorcin fuchsin stain, 2 hours; 95 per cent. alcohol, 1 min.; fresh alcohol, 3 min.; absolute alcohol, 2 minute; cleared in xylol 12 hours and mounted in Canada balsam.

OBSERVATIONS UPON THE ANATOMY OF THE UTERUS.

In General.—The musculature of the uterus and its blood vessels present peculiarities found nowhere else in the body.

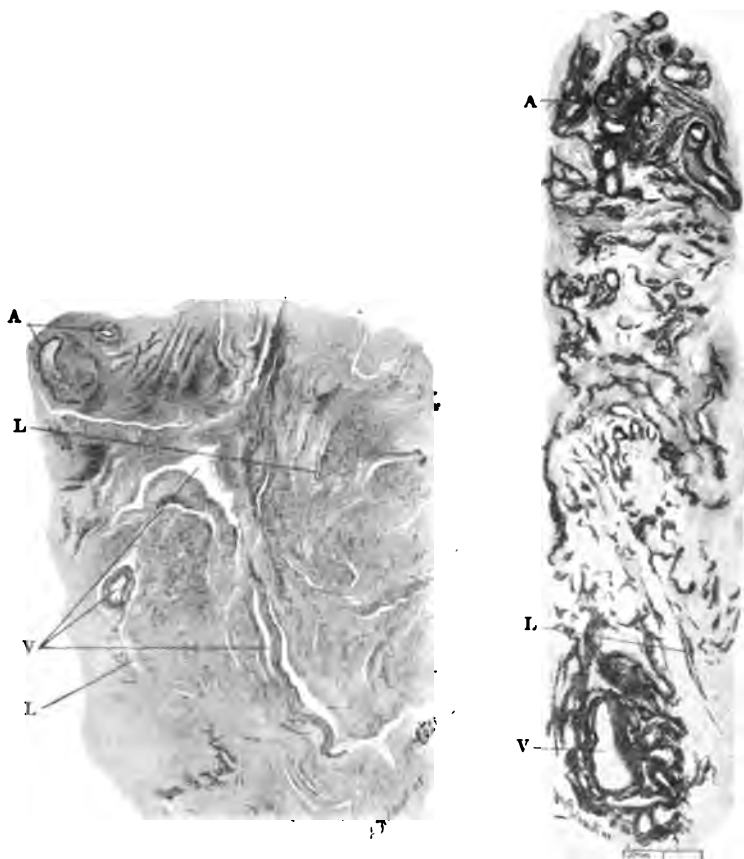


Fig. 3. Nulliparous uterus. Area of the vascular layer showing some of the smaller vessels. Weigert's. A., arteries. V., veins. L., lymph spaces. There is little elastica in this layer except that of the vessel walls. In the arterioles a definite internal elastic membrane can be seen; the veins show an irregular arrangement of the elastica—most of it at the periphery of the vessel. The elastica of the lymph spaces is not well formed and consists of isolated fibrils. Note the fineness of the elastic fibers and the absence of clumping. The clefts in the tissue with no elastica about them are artefacts produced by shrinkage of the tissues during the hardening.

Fig. 4. Multiparous uterus. Area of the vascular layer, showing some of the smaller vessels. Weigert's. A., arteries. V., veins. L., lymph spaces. The increase in elastic tissue the result of pregnancy is at once seen when this picture is compared with Fig. 3. Observe the tendency to clumping of the fibrils.

The fibrous and muscular tissue interlace so intimately that by an ordinary hematoxylin, eosin stain, it is difficult to differentiate between them (Fig. 1).

Vessels in Hematoxylin-Eosin Preparations.—The larger blood vessels, especially the arteries, frequently run in groups (Fig. 1). The arteries are distinguishable from the veins even in

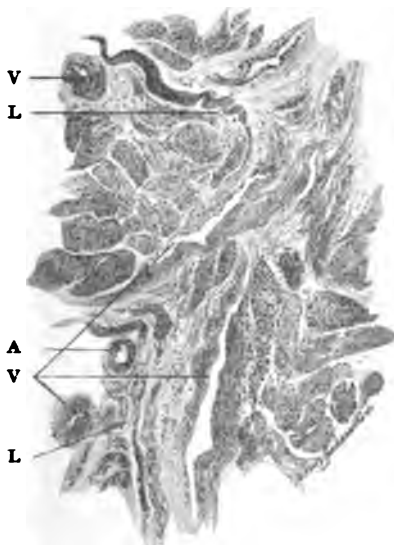


Fig. 5. Nulliparous uterus. Area of the vascular layer, showing some of the smaller vessels. Hematoxylin-eosin. A., arteries. V., veins. L., lymph spaces. No difference can be distinguished in sections thus stained between the nulliparous and the multiparous uterus. Arteries may be distinguished from veins by the circular arrangement of the fibers of the media. The veins show a longitudinal direction of the fibromuscular tissue forming their walls. They either have well-formed walls or appear merely as clefts between adjacent muscle bundles lined with endothelium. The smaller veins resemble the larger lymph spaces.

hematoxylin-eosin preparations by a thicker wall (Fig. 5), by the circular direction of the tunica media, and by an outer fibrous coat, which sends off shoots between the surrounding muscle bundles. The veins in an ordinary preparation appear for the most part as clefts, lined with endothelium, between

diverging and converging muscular bundles. Sometimes the coat is more clearly defined and the vessel appears circular, but there is no circular direction to the tissue in its wall and one could not say how much fibrous and how much muscular tissue its wall contained (Fig. 14).

Vessels in Van Gieson Preparations.—In sections stained by Van Gieson's method (Fig. 7), the intima and media of the arteries are yellow, while the adventitia is a brilliant red. The same color reaction distinguishes muscular from fibrous tissue throughout the specimen. The veins (Fig. 11), whether they appear as clefts between the muscle bundles or as separate structures are seen to possess an inner coat composed mostly of fibrous tissue, in which there are muscle fibers running longitudinally in the direction of the long axis of the vessel

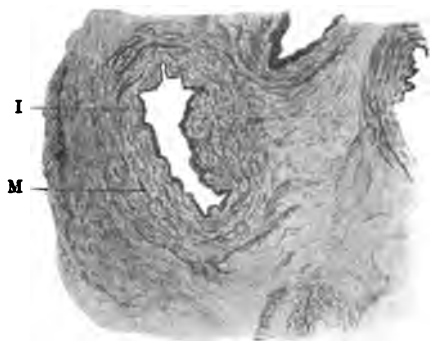


Fig. 6. A group of arteries from the vascular layer of a nulliparous uterus. Weigert's. Note the fine anastomosing smooth fibrils throughout the media (M.). The internal elastic membrane (I.) is well formed and regular. There is no breaking or clumping of the fibrils. Contrast this with Figs. 8, 15 and 17.

and an outer coat richer in muscle and less rich in fibrous tissue, and directly continuous with or indeed actually a part of the surrounding musculature (Fig. 5).

Elastic Tissue.—By Weigert's stain the elastic fibers are found throughout the muscularis. In the vascular layer they are continuations of the elastica of the adventitia of the blood vessels. In the submucous layer they disappear outside the vessels. In the subserous and supravascular layers they pursue a centripetal direction from the serosa inwards, running in fine, smooth, continuous anastomosing fibrils (Fig. 23).

The entire wall of both arteries (Fig. 6) and veins (Fig. 10) is spun through with extremely fine anastomosing elastic fibrils;



Fig. 7. The same group of arteries as in Fig. 6. Van Gieson's. The media (M.) takes an almost uniform yellow color (muscle); A., the adventitia, a brilliant red (fibrous). Note the regular circular arrangement of the fibrous tissue lying between the circular muscle bundles of the media. Contrast this with Figs. 9, 16 and 18.

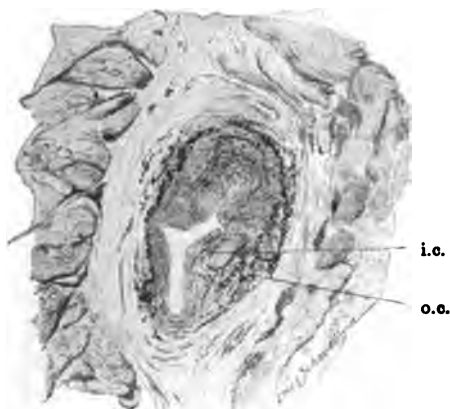


Fig. 10. Medium-sized vein from vascular layer of nulliparous uterus. Weigert's. Observe that the inner coat (i.c.) is spun through with fine elastic fibrils; the elastic tissue is especially condensed at the border between the inner (i. c.) and the outer (o. c.) coat. It is all rather irregular, but shows no tendency to clumping. Compare this with Figs. 12 and 20.

at certain parts these are thickened and form distinguishing features.

Between the intima and the media of the arteries is a wavy

line of elastic tissue of especial density which is spoken of as the internal elastic lamina. The outline of this lamina is smooth and unbroken. Between the media and the adventitia in larger vessels there is another well-formed elastic line (the external elastic lamina), but it is less marked than the internal one.

The venous wall also is spun through with elastic tissue which condenses at the border between the inner and the outer coat, although it never forms a sharp elastic lamina as is found in the arteries (Fig. 10).

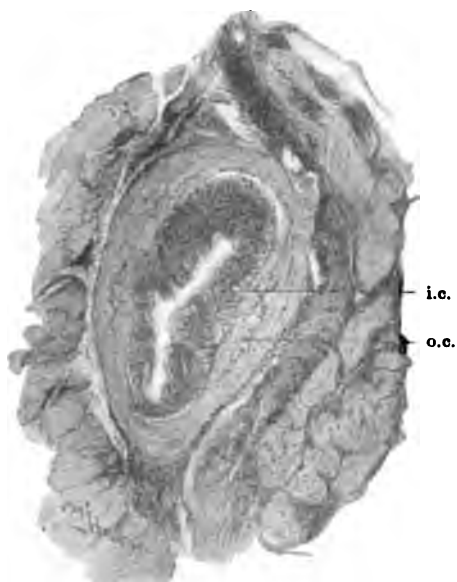


Fig. 11. Same vessel as in Fig. 10. Van Gieson's. The inner coat (i. c.) consists mostly of fibrous tissue (red). The outer coat (o. c.) shows muscular fibers (yellow) without any special circular arrangement; many of them are longitudinal. Compare with Figs. 13 and 21.

The anatomical description so far applies to adult nulliparous organs. In the case of infants and children my observations agree entirely with those of Theilhaber and Meir, already given.

Features which Distinguish the Parous from the Nulliparous Uterus.—There are certain departures from the nulliparous type in the arteries and in the vessels of a parous uterus which are distinctly characteristic. In every one of my cases it is easy to say after studying a section stained by Weigert's method, whether or not the woman has had children. This is also possible

but to a decidedly less extent, in sections stained by Van Gieson's method.

The changes due to pregnancy and parturition occur as a rule in proportion to the parity of the individual, *e. g.*, uteri repeatedly pregnant show more changes than the uteri of primipara. Similar alterations were never observed in the uteri of nullipara.

In describing these alterations for the sake of clearness I shall take them in groups.

I. ARTERIAL.

Intramural Degeneration.—Van Gieson's Stain.—The muscle and fibrous tissue of the vessel wall no longer preserve their normal relation (Fig. 9). Deposits of red (fibrous tissue) are found within the media and the sharp line of differentiation between the media and the adventitia is obscured. The adventitia is thickened.

Weigert's Resorcin-Fuchsin Stain.—The elastic tissue of the media is increased (Fig. 8) corresponding to the increase of fibrous tissue found there by Van Gieson's stain. The internal elastic lamina no longer presents its smooth, unbroken, regularly wavy appearance. It is thickened and splits eccentrically into several layers which are unequal in thickness and show no symmetry in form or arrangement. The elastic tissue is increased throughout the arterial wall, but especially in the positions I have mentioned. In the larger arteries the external elastic lamina presents changes similar to those of the internal.

Hematoxylin-Eosin Stain.—The media stains like hyaline tissue and has a granular appearance, and there is a great diminution in the number of nuclei.

The changes above described, I have referred to in my table as *intra-mural arterial degeneration*.

PERI-ARTERIAL DEGENERATION—ARTERIAL OBLITERATION.

There is another form of change found in the arteries especially the smaller ones of the uteri of multipara. This alteration affects principally the adventitia, but it extends finally to the entire vessel wall and ends in complete obliteration of the vessel.

Van Gieson's Stain.—The adventitia instead of being red takes a bright yellow stain (Fig. 16). Usually the media contains some fibrous (red) tissue. The yellow adventitia is lighter than the yellow of the muscle surrounding it and may be thicker on one side of the vessel than on the other. It is closely connected to the surrounding tissue by a fine fibrous (red) reticulum from which, however, it stands out prominently.

Sometimes the entire vessel is represented by this bright yellow tissue (Fig. 18) in the center of which are a few fibrous strands (red) indicating the previous position of the lumen. Irregular patches of this bright yellow tissue are found occasionally, in the uterine wall, which represent the degenerated adventitia of a vessel cut lengthwise.

Weigert's Resorcin-Fuchsin Stain.—The areas described as bright yellow appear intensely black (Fig. 15). The elastic tissue occurs in irregular clumps, but these are so closely combined that the adventitia may look like a solid mass of elastic tissue.

In the earlier cases the internal elastic lamina may be well preserved. In others it may be slightly altered. In advanced cases (Fig. 17) it is fused with the adventitial mass (Fig. 17).

Hematoxylin-Eosin Stain.—The adventitia of the vessels has a granular hyaline appearance in which there are few nuclei. In advanced cases (Fig. 19) the vessel is represented by a disc of this granular hyaline colored material in the center of which the lumen of the vessel can be faintly discerned lined with endothelium, or the vessel is entirely obliterated, and there is no evidence of a lumen. The advanced cases illustrate the physiologic diminution of the vascular area in the uterus, which is incident to old age. Certain of the arterial branches are completely obliterated. The early changes of this sort I have designated as periarterial degeneration.

EXPLANATION OF PLATE I

- Fig. 15. Group of arteries from vascular layer of multiparous uterus. Weigert's. The internal elastic lamina (i. e. l.) appears well preserved; there is no tendency to clumping of the elastic fibers in the media (M.). The adventitia (A.) presents solid clumps of elastic tissue. *Periarterial degeneration.* Compare with Figs. 6 and 8.
- Fig. 16. Same group of vessels as in Fig. 15. Van Gieson's. The intima (I.) and media (M.) appear practically normal; around the inner part of the adventitia (A.) is a broad ring of tissue which takes a bright yellow stain. The adventitia appears to have broadened and undergone degeneration. The degenerated (bright yellow) areas (D.) are interpenetrated by septa from the inner unchanged (red) portions of the adventitia (A.). *Periarterial degeneration.* Compare with Figs. 7 and 9.

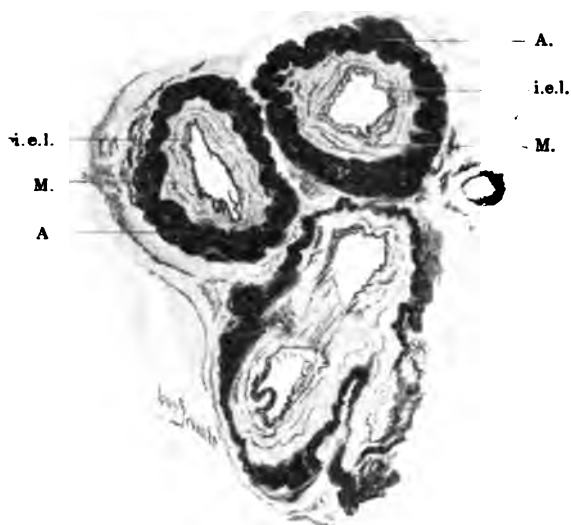


Fig. 15.



Fig. 16.

2. VENOUS.

Van Gieson's Stain.—The internal layer (Fig. 21) becomes broader and contains more fibrous tissue; this layer takes a brilliant red color with occasional fine streaks of yellow.

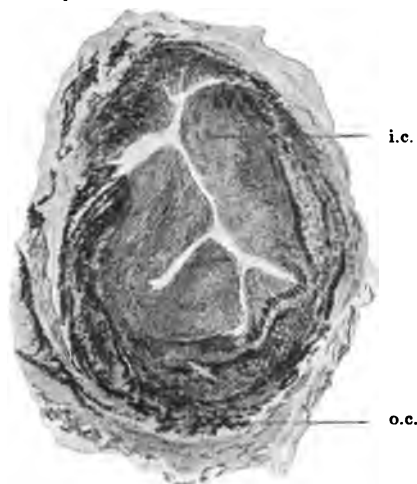


Fig. 12. Large vein from vascular layer in multiparous uterus. Weigert's. The inner coat (i. c.) is thickened and fine elastic tissue is seen throughout; between the inner (i. c.) and the outer (o. c.) coat the elastic tissue is considerably increased and shows considerable clumping. Compare with Fig. 10.

The external layer takes a light yellow color and appears considerably broadened. There are a few fibres of fibrous tissue running through the yellow tissue dividing it into clumps or patches. This fibrous tissue merges with the fascia of the surrounding muscle bundles. The yellow of this external layer is considerably brighter than the yellow of the muscular tissue and presents a striking contrast to it.

Weigert's Resorcin-Fuchsin Stain.—The internal layer (Fig. 20) appears spun through with delicate elastica. The external layer consists of clumps of intensely black elastic tissue in which few individual fibres can be made out. These clumps correspond to the bright yellow areas referred to under Van Gieson's stain.

Hematoxylin-eosin Stain.—The endothelial lining of the vessel (Fig. 22) can be easily distinguished by the nuclei of the cells. The tissue of the internal coat appears like ordinary fibrous tissue and has no circular arrangement. Outside of this

the external coat shows a hyaline-like change, a granular red background in which there are few nuclei. This degenerated area corresponds exactly with the black of the Weigert sections and the bright yellow of the Van Geison ones. Such changes



Fig. 13. Same vessel as in Fig. 12. Van Gieson's. The inner coat (i. c.) is irregularly thickened and the amount of fibrous tissue (red) in the vein is considerably increased. The outer coat (o. c.) shows about the proper proportion of muscle (yellow). Compare with Fig. 11.

EXPLANATION OF PLATE II.

- Fig. 8. Medium-sized artery from vascular layer of multiparous uterus. Weigert. Note the increase of elastic tissue in the media (M.) and adventitia (A.). The internal elastic lamina (I.) is greatly thickened and the fibers are broken and gathered into clumps. *Intramural arterial degeneration*. Compare with Fig. 6.
- Fig. 9. Same artery as in Fig. 6. Van Gieson's. Observe the increase of fibrous tissue (red) in the media (M.) and its irregularity. *Intramural arterial degeneration*. Compare with Fig. 7.
- Fig. 17. Small artery of vascular layer of multiparous uterus. Weigert's. The internal elastic lamina (i. e. l.) can still be seen in part well preserved. The adventitia (A.) and part of the media (M.) are represented by a solid mass of elastic tissue. To the left is a sagittal section through the degenerated coats of the same vessels (S. S.). *Arterial obliteration*. (Early). Compare with Figs. 6, 8 and 15.
- Fig. 18. Same vessel as Fig. 17. Van Gieson's. The area represented by the elastic tissue in Fig. 16 is here of a bright yellow color. A little fibrous tissue (red) of the adventitia (A.) and media (M.) remain. *Arterial obliteration*. (Early). Compare with Figs. 7, 9 and 16.
- Fig. 19. Same vessel as in Figs. 17 and 18. Hematoxylin-eosin. The area represented by the black of Fig. 17 and by bright yellow in Fig. 18 is here pink and has a granular appearance. There are few nuclei. This is not a hyaline change as might at first appear. See Fig. 22. The adventitia of the vessels shown in Fig. 15 and 16 had this pink granular appearance in sections stained with eosin-hematoxylin. *Arterial obliteration*. (Early.)

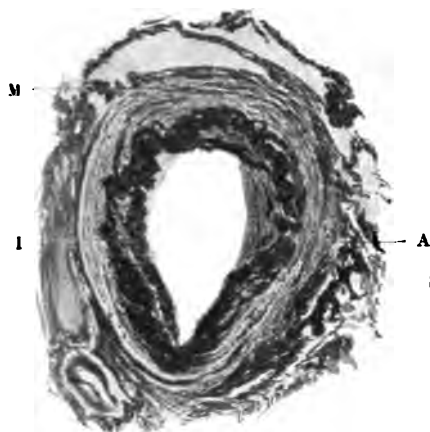


Fig. 8.



Fig. 17.



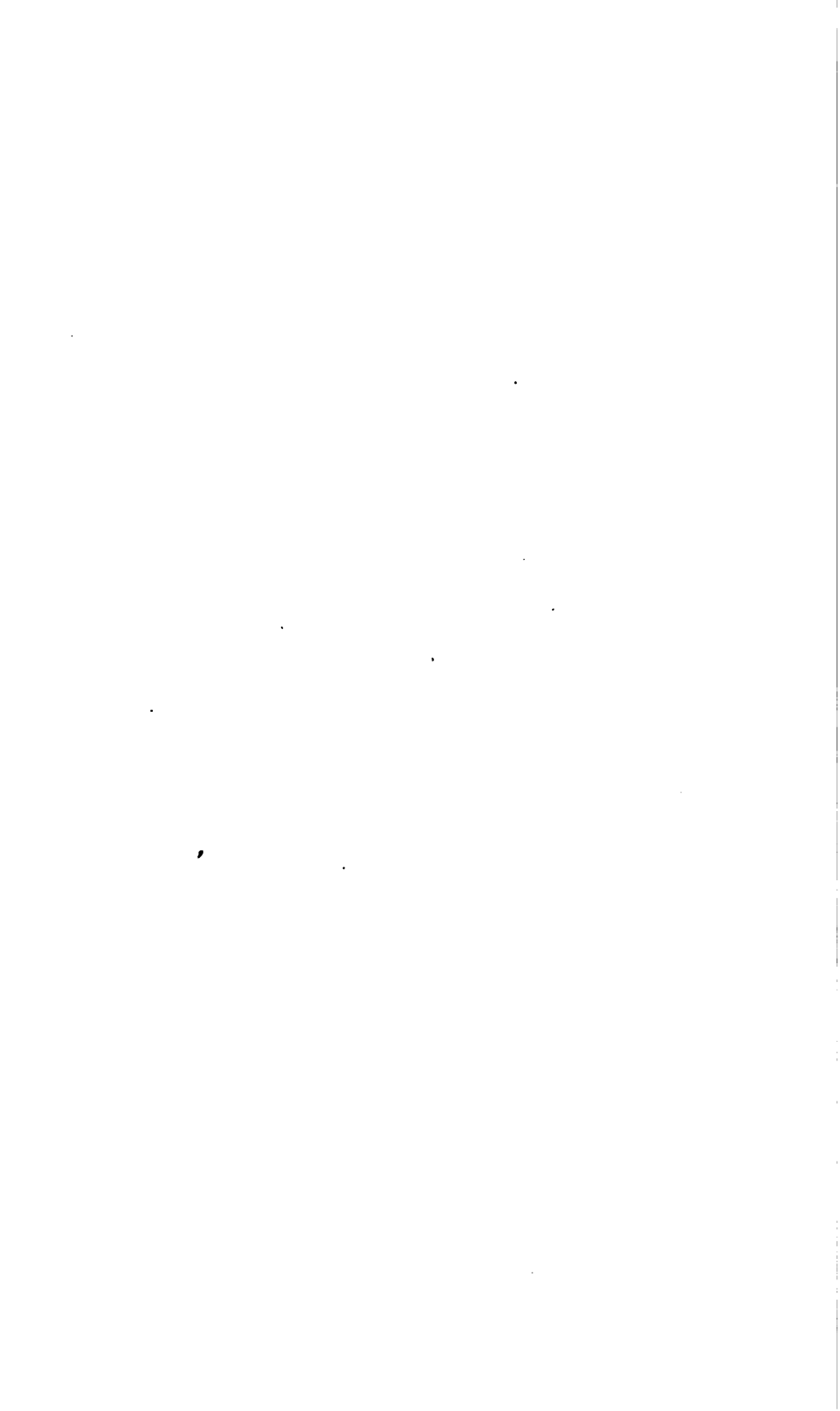
Fig. 18.



Fig. 9.



Fig. 19.



as these I have designated in the table perivenous degeneration. The alteration that takes place in the veins of the parous uterus affects the smallest as well as the largest veins. The term perivenous degeneration has been applied only to the very marked cases in the larger veins. The principal change is an increase of the elastica in the outer coat. This in the larger vessels appears light yellow by Van Gieson's stain and has a pink granular appearance in ordinary hematoxylin-eosin preparations (Fig. 22).



Fig. 14. Same vessel as in Figs. 12 and 13. Hematoxylin-eosin. The endothelial lining is very plain. No differentiation between the inner and outer coats could be made from this section. A hematoxylin-eosin preparation of the vein shown in Figs. 10 and 11 looked very much like this.

Relative Proportion of Fibrous and Muscular Tissue.—The proportion of fibrous and muscular tissue outside the vessels, as shown by Van Gieson's stain, is more difficult to determine than are the changes in the elastic tissue. Van Gieson sections are judged by comparing their color under an ordinary reading glass. An estimate of the proportion of fibrous as compared to the muscular tissue, is quite impracticable by any other means. Under a greater magnification one sees too little of the section at a time, and in different fields there are different proportions, so that the only satisfactory way to get the proportion as a whole is to view the entire section and note its color. This is easily done. In my cases I took, as a standard, the uterus of a 17-year-old nulliparous woman. In this, under low magnification, about an equal mixture of yellow and red could be discerned. Cases showing more yellow were designated yellow; those showing slightly more red were marked reddish

yellow; still more, yellowish red; those pronouncedly red, were labeled red.

It will be seen from the table of cases that the proportion of fibrous tissue was increased in all of the uteri where there had been multiple pregnancies, except in one case. The difference, however, is not marked and does not seem to be as constant as the variation in elastic tissue following pregnancy. Three nulliparous uteri showed quite as much fibrous tissue as Case 1033, where the uterus had been eight times pregnant.

In the cases noted clinically as metrorrhagia myopathica there was an increased amount of fibrous tissue. It is noticeable, however, that these were cases where pregnancy had occurred frequently and that sections of uteri of equal parity contained just as much fibrous tissue even though there had been no metrorrhagia. As said before, there is not nearly as much difference in the relative proportions of fibrous and muscular tissue between nulliparous and parous organs as was noted in respect to elastic tissue. The influence of the proportion of fibrous tissue alone, therefore, upon metrorrhagia remains doubtful. Theilhaber and Meier speak of the coexistence of an increased proportion of fibrous tissue plus an imperfect obliteration of the uterine vessels in cases of metrorrhagia myopathica at the time of the menopause. In other words, they believe in insufficient contractile power of the uterus in the presence of abnormally wide blood channels will result in hemorrhage. To actually verify an unusual width of blood vessels is nearly physically impossible, and when the contraction that normally occurs after the action of any hardening agent is remembered any estimate is more or less unreliable. Although Theilhaber's views are logical I have not been able to verify them.

Proportion of Elastic Tissue Exclusive of that in the Vessel Walls.—The amount of elastic tissue in the sections is estimated from the vascular layer and from the subserous and supra-vascular layers. There is no elastica outside the blood vessels in the submucous layer. As most of the elastica of the vascular

EXPLANATION OF PLATE III.

- Fig. 20. Large vein from vascular layer multiparous uterus. Weigert's. The inner coat (i. c.) shows no change. The outer coat (o. c.) is represented by large deposits of elastic tissue in clumps. *Perivenous degeneration.* Compare with Fig. 10.
- Fig. 21. Same vessel as in Fig. 20. Van Gieson's. The area of elastic tissue shown in Fig. 20 is represented here by bright yellow tissue (o. c.) which contrasts markedly with the yellow of the surrounding muscle bundles. *Perivenous degeneration.* Compare with Fig. 11.



Fig. 20.

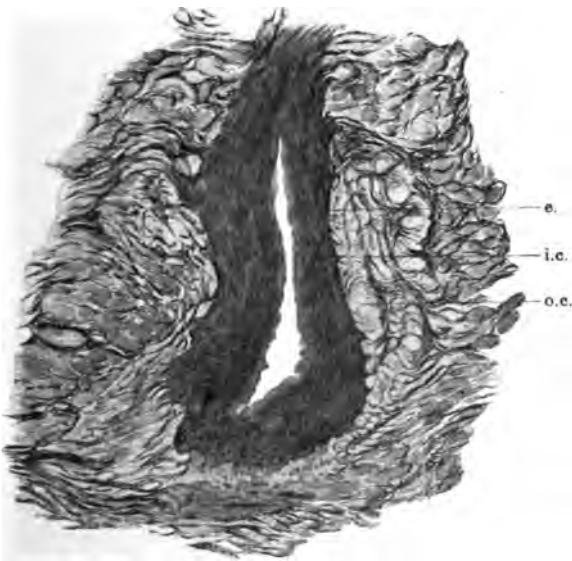
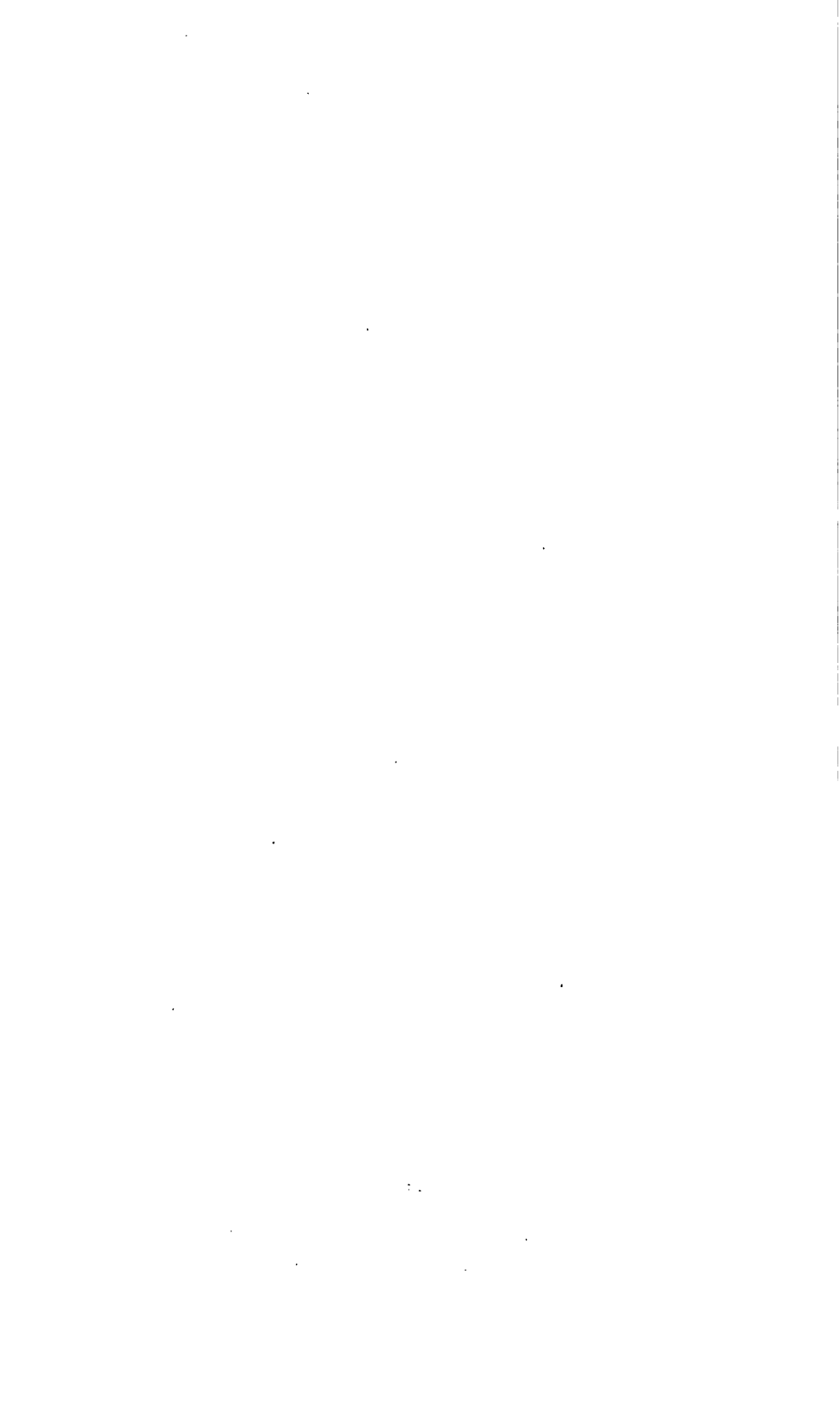


Fig. 21.



layer is derived from the outer coats of the vessels, the amount of it in each section is indicated by the vascular changes. In the subserous and supravascular layers it can be easily estimated. The amounts and form of the elastica were judged in each case. While in the non-parous uterus the elastic fibers are smooth, more or less unbroken and straight, in parous organs they become increased in thickness, broken and finely curled or gathered into thick clumps (Figs. 23 and 24). These changes are indicated for each specimen in the table. The alterations in the elastica of these outer layers are quite constant, occurring in all but two (primipara) cases of parous uteri and one multiparous organ (case of metrorrhagia myopathica).

Analysis of Cases Diagnosed Clinically as Metrorrhagia Myopathica.—Before attempting to ascertain the pathology of metrorrhagia myopathica, it is requisite that care be taken to exclude cases in which the origin of the hemorrhage was not strictly confined to the uterus itself. After critically examining the five clinical cases I find that two of them might be explained upon other grounds. A summary of the cases follows:

G. No. 170, P. No. 93. W. C.—Aged 48. Married. Eight children; no miscarriages. Always had leucorrhea. Menstruation irregular before marriage, coming every two weeks to two months, lasting one week. Since marriage regular until eight years ago. Since then profuse menorrhagia and metrorrhagia. Operation, panhysterectomy. Uterus, 10 cm. long. Endometrial cavity, 8 cm. long. No adhesions. Right ovary, $3 \times 2\frac{1}{2} \times 1$ cm. cystic degeneration. Left ovary, $2 \times 1\frac{1}{2} \times \frac{1}{2}$ cm., atrophic. Tubes normal. Endometrium atrophic at fundus. Pronounced cystic changes in cervix and lower part of endometrium. Palpable arteriosclerosis of uterine arteries. The cystic changes in the endometrium may be responsible for the metrorrhagia in this case. I am positive that cystic endometritis may produce metrorrhagia, because I have frequently found a cystic endometritis where from the clinical symptoms carcinoma of the fundus was suspected and a diagnostic curettage was performed. None of these cases, so far as I know, have had a recurrence of symptoms. It is possible that the cystic changes in the endometrium are the result of some circulatory disturbance, for in one of our cases (see below) the first curettage showed the endometrium normal while the second, several months after, found a pronounced cystic endometritis.

(I am unable to find from the history what means were

employed previous to hysterectomy to control hemorrhage in this case. There is scarcely any doubt that curettage or some intrauterine treatment had been used.)

However, I have set down this first case as one of cystic degeneration of the cervix and cystic endometritis.

G. No. 762, P. No. 558, S. C.—Aged 42. Married. Ten children; three miscarriages. Until three years ago menstruation regular every twenty-five days, duration, seven days. No pain. For past three years, irregular every two weeks to twenty-five days. Profuse; duration, seven to ten days.

Operation.—Supravaginal hysterectomy. Uterus 8 cm. from point of section to fundus. Endometrial cavity 6 cm. from point of section to fundus. No adhesions. Right and left ovaries $4 \times 2 \times 1\frac{1}{2}$ cm. Tubes normal. No palpable sclerosis of uterine vessels. Acute endometritis.

No preliminary curettage was done in this case and the patient died of septic peritonitis. At the time this was inexplicable. An examination of the endometrium, however, showed infiltration throughout with polymorphonuclear leucocytes. The menorrhagic symptoms cannot be explained on the grounds of an acute endometritis for they had existed for three years and the endometritis from the histologic appearance must have been very recent. As there was no other apparent reasons for the hemorrhage I have included this under the cases of metrorrhagia myopathica.

G. No. 763, P. No. 559, A. C.—Aged 42. Married. Two children; one miscarriage. Leucorrhea at times. Metrorrhagia for two years.

Operation.—Supravaginal hysterectomy. Uterus from point of amputation to fundus 10 cm. No adhesions. Endometrial cavity from point of amputation to fundus 8 cm. Right ovary, $5 \times 4 \times 3\frac{1}{2}$ cm., graafian follicle cysts. Left ovary and both tubes

EXPLANATION OF PLATE IV.

- Fig. 22. Same vessel as in 20 and 21. Hematoxylin-eosin. The inner coat (i. c.) and the endothelial lining (e.) appear entirely normal. As in Fig. 14. The outer coat (o. c.) is represented by an area which takes the eosin (pink), has few nuclei and is granular in appearance. See area enlarged at (X.). *Perivenous degeneration.* Compare with Fig. 14.
- Fig. 23. Section of wall of nulliparous uterus. Weigert's. Observe the finely branching elastica; especially marked in the stratum subserosum (s. s.). Note the general centripetal direction of the fibers. Stratum supravasculare (s. s. v.). Outer limits of stratum vasculare (s. v.).
- Fig. 24. Section of wall of multiparous uterus. Weigert's. Observe the clumping of the elastica; the curling and coarseness of the fibrils. Subserous layer (s. s.). Supravascular layer (s. s. v.).

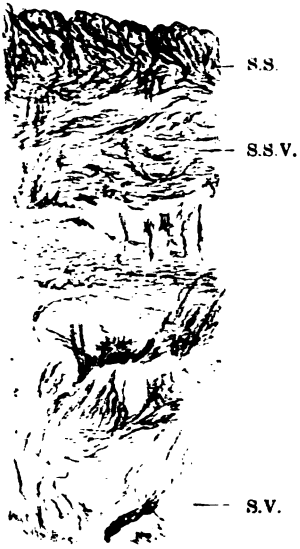


Fig. 23.



Fig. 22.

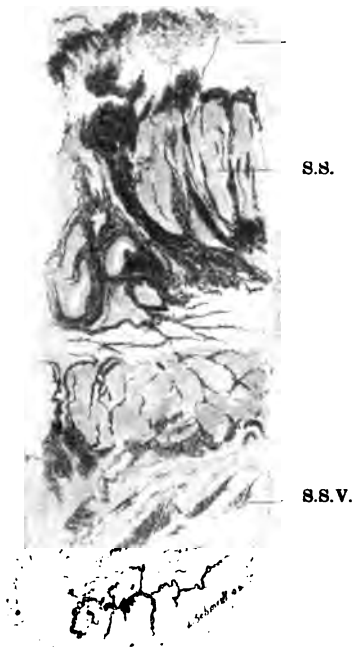
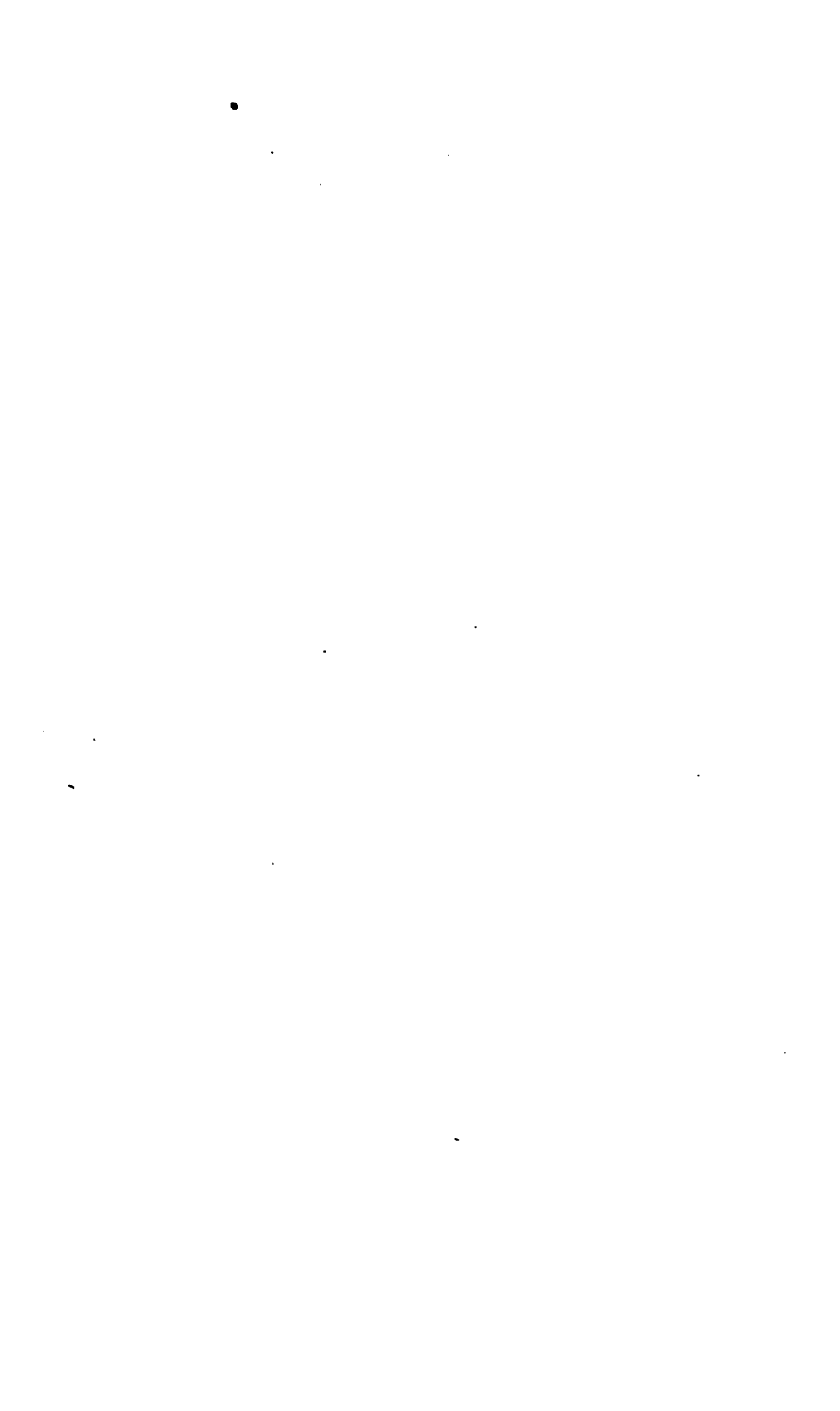


Fig. 24.



normal. Endometrium normal. No palpable sclerosis of uterine vessels.

There is no reason to exclude this from the list of cases of metrorrhagia myopathica.

G. No. 1176, P. No. 807, M. B.—Aged 51. Married. Four children; one miscarriage. Profuse menorrhagia and metrorrhagia for past two years.

Operation.—Panhysterectomy. Uterus 8 cm. long. Endometrial cavity 6 cm. long. No adhesions. Right ovary $3 \times 2 \times 1$ cm., normal. Left ovary $3 \times 2 \times 1\frac{1}{2}$ cm., Graafian follicle cyst. Tubes normal. Endometrium normal. Palpable sclerosis of uterine vessels in broad ligament.

This case is included as one of metrorrhagia myopathica.

G. No. 1362, P. No. 958, E. S.—Aged 39. Married. Two children; four miscarriages; four still born. Leucorrhea constant. Menorrhagia and almost constant metrorrhagia for past year. Curettage three months before did no good. At that time examination of scrapings showed normal endometrium.

Operation.—Supravaginal hysterectomy. Uterus from point of section to fundus 8 cm. Endometrial cavity from point of section to fundus 6 cm. Right ovary $4 \times 3 \times 2$ cm., Graafian follicle cyst. Left ovary $4 \times 4 \times 2\frac{1}{2}$ cm. hydrops folliculi. Tubes normal. No palpable sclerosis of uterine vessels. This case cannot be included with those of metrorrhagia myopathica because of the history of miscarriage and still births and because of mitral heart disease. The cystic degeneration of the endometrium followed the first curettage when the endometrium appeared normal. As syphilis or heart disease might have explained this case it has not been regarded as coming under the head of metrorrhagia myopathica.

PATHOLOGICAL ANATOMY OF METRORRHAGIA MYOPATHICA.

The results of the findings in these three cases of metrorrhagia myopathica can be seen in the table. Briefly they are as follows:

Thickness of uterine wall: 17, 25 and 21 mm. respectively. ✓

Fibrous tissue: No increase in first; marked increase in second; moderate increase in third.

Elastic tissue: Moderate increase in first; slight in second; excessive in third.

Vascular changes: Same degree as noted for the elastic tissue. The anatomical changes in these cases are not constant and therefore I am unable to draw positive conclusions. In the

Case.	Age.	Married or Single.	Number of Children.	Miscarriages.	Menstrual Flow.	Metrorrhagia.	Chief Complaint.	Provisional Diagnosis.
I.—A. L., G. No. 1528; P. No. 1070...	27	S.	0	0	Regular duration, 7 days.	None.....	Pain.....	Pelvic inflammatory disease.
II.—C. N., G. No. 589; P. No. 428....	30	S.	0	0	Regular; profuse.	None.....	Pain.....	Pelvic inflammatory disease.
III.—I. C., G. No. 822; P. No. 587....	32	M.	0	0	Regular....	None.....	Pain.....	Pelvic inflammatory disease.
IV.—J. McC., G. No. 613; P. No. 437....	37	M.	0	0	Regular; profuse.	None.....	Pain.....	Pelvic inflammatory disease.
V.—C. S., G. No. 991; P. No. 692....	37	M.	0	0	Regular; profuse.	None.....	Pain and menorrhagia.	Pelvic inflammatory disease.
VI.—E. J., G. No. 1355; P. No. 936....	22	S.	1	0	Regular....	None.....	Pain.....	Pelvic inflammatory disease.
VII.—C. B., G. No. 1526; P. No. 1069....	23	M.	3	0	Regular....	None.....	Pain.....	Pelvic inflammatory disease.
VIII.—A. P., G. No. 806; P. No. 643....	25	M.	1	0	Regular; profuse.	None.....	Pain.....	Pelvic inflammatory disease.
IX.—A. D., G. No. 31; P. No. 254....	28	M.	1	0	Irregular; profuse.	Occasional; slight.	Pain.....	Pelvic inflammatory disease.
X.—C. G., G. No. 963A; P. No. 686....	29	M.	1	0	Irregular; scanty.	None.....	Pain.....	Pelvic inflammatory disease.
XI.—N. M., G. No. 559; P. No. 400....	31	M.	1	0	Regular....	None.....	Pain.....	Pelvic inflammatory disease.
XII.—M. H., G. No. 618; P. No. 447....	32	M.	2	0	Regular; profuse.	None.....	Pain.....	Pelvic inflammatory disease.
XIII.—M. R., G. No. 961; P. No. 689....	35	M.	2	0	Regular; scanty.	None.....	Pain.....	Pelvic inflammatory disease.
XIV.—E. B., G. No. 862; P. No. 618....	36	M.	8	0	None since last labor.	None.....	Pain.....	Pelvic inflammatory disease.
XV.—S. B., G. No. 524; P. No. 382....	37	M.	4	3	Regular....	Slight.....	Pain.....	Pelvic inflammatory disease.
XVI.—E. S., G. No. 1362; Po. No. 958..	39	M.	2	8	Irregular...	Constant...	Metrorrhagia	Metrorrhagia myopathica
XVII.—M. B., G. No. 568; P. No. 415....	41	M.	6	2	Regular....	None.....	Pain.....	Pelvic inflammatory disease.
XVIII.—S. C., G. No. 762; P. No. 558....	42	M.	10	3	Irregular...	Constant...	Metrorrhagia	Metrorrhagia; myopathica.
XIX.—A. C., G. No. 763; P. No. 559....	42	M.	2	1	Irregular...	Constant...	Metrorrhagia	Metrorrhagia; myopathica.
XX.—C. H., G. No. 1152; Po. No. 796..	41	M.	1	0	Regular....	None.....	Dysmenorrhea.	Hyperplasia uteri.
XXI.—W. C., G. No. 170; P. No. 93....	46	M.	8	0	Irregular...	Constant...	Metrorrhagia	Metrorrhagia; myopathica.
XXII.—M. B., G. No. 1176; P. No. 807....	51	M.	4	1	Irregular...	Constant...	Metrorrhagia	Metrorrhagia; myopathica.
XXIII.—A. B., G. No. 1345; P. No. 1033..	56	M.	8	0	Regular....	None.....	Dragging sensations.	Descensus uteri.

Revised Diagnosis.	Thickness of Uterine Wall	Peri- venous Degen- eration.	Intra- mural Ar- terial De- generation	Peri- arterial Degen- eration.	Color by Van Gieson's Stain.	Condition of Elastica in Subserous and Supravascular Layers.	State of Endome- trium.
Pelvic inflamma- tory disease.	10 mm.	None....	None....	None....	Yellow and red.	Normal.	
Pelvic inflamma- tory disease.	9 mm.	None....	None....	None....	Yellowish red.	Normal.	
Pelvic inflamma- tory disease.	17 mm.	None....	None....	None....	Yellowish red.	Normal.	
Pelvic inflamma- tory disease.	10 mm.	None....	None....	None....	Reddish yel- low.	Normal.	
Pelvic inflamma- tory disease.	19 mm.	None....	None....	None....	Yellowish red.	Normal.	
Pelvic inflamma- tory disease.	19 mm.	Slight....	Slight....	None....	Reddish yellow.	Moderate increase.	
Pelvic inflamma- tory disease.	19 mm.	Moderate.	Slight....	Slight....	Reddish yellow.	Slight increase; clumpy.	
Pelvic inflamma- tory disease.	22 mm.	Slight....	Slight....	None....	Reddish yellow.	Normal.	
Pelvic inflamma- tory disease.	22 mm.	Slight....	Slight....	None....	Yellowish red.	Slight increase.	
Pelvic inflamma- tory disease.	26 mm.	Slight....	Slight....	None....	Red.....	Slight increase; curly.	
Pelvic inflamma- tory disease.	12 mm.	Slight....	Slight....	None....	Reddish yellow.	Normal.	
Pelvic inflamma- tory disease.	21 mm.	Slight....	Slight....	None....	Reddish yellow.	Slight increase; curly.	
Pelvic inflamma- tory disease.	14 mm.	Slight....	Slight....	Moderate.	Red.....	Slight increase; clumpy.	
Puerperal metri- tis.	25 mm.	Moderate.	Slight....	Slight....	Yellow....	No increase, but curly and clumpy.	
Pelvic inflamma- tory disease.	17 mm.	Moderate.	Moderate.	Moderate.	Yellow and red.	Slight in- crease some curling.	
Mitral heart dis- ease, syphilis, cystic glandu- lar endometri- tis.	20 mm.	Moderate.	Moderate.	Moderate.	Yellowish red.	Moderate increase; clumpy.	Cystic glandular endometritis.
Pelvic inflamma- tory disease.	17 mm.	Excessive.	Excessive.	Moderate.	Reddish yellow.	Moderate increase; curly.	
Metrorrhagia myopathica.	17 mm.	Slight....	Slight....	None....	Reddish yellow.	Moderate increase; very curly.	Acute septic endometritis.
Metrorrhagia myopathica.	25 mm.	Slight....	Slight....	None....	Red.....	Normal.....	Normal.
Hyperplasia uteri.	16 mm.	Slight....	Slight....	None....	Reddish yellow.	Slight increase; curly.	
Cystic degen- eration of cervix hyperplasia uteri.	25 mm.	Excessive.	Moderate.	Excessive.	Red.....	Excessive increase; clumpy.	Cystic degen- eration of cervix.
Metrorrhagia myopathica.	21 mm.	Moderate.	Moderate.	Moderate.	Red.....	Moderate increase; clumpy.	Normal.
Descensus uteri.	22 mm.	Moderate.	Moderate.	None....	Yellowish red.	Excessive in- crease; clumpy and curly.	

first two cases, the amount of elastic tissue and the vascular changes are not proportionate to the parity of the uteri. Thus the first case had had ten children and three miscarriages and yet the changes in the elastic tissue in the vessels were not as pronounced as would be expected. In the second case, two children and one miscarriage, there was scarcely more alteration than is usually found in a primipara. The fibrous tissue was disproportionately increased in the second case. In the first there was not as much as would be expected from the parity of the individual. In the third case, the amount corresponded to the history of the uterus.

From the first two cases it might be said that a failure of the normal increase in elastic tissue had resulted in an insufficient contractility of the uterus and a resulting congestion and hemorrhage. Pick records a case of a woman 63 years old, who had metrorrhagia which resisted all ordinary means of treatment. Hysterectomy (vaginal) was performed. "Outside of the somewhat arteriosclerotic vessels there was no mentionable increase of elastic tissue." From these three cases it might be inferred that a failure in the development of elastica was the essential lesion in metrorrhagia myopathica. The last case in my series, however, forbids any such conclusions at this time. To settle the question it will be necessary to study additional cases, determining first whether they actually belong under the head of metrorrhagia myopathica, excluding all of the well-known causes, general and local, before they are so classified. Although by Van Gieson's stain I have not found any fibrous tissue changes constant, I propose to study subsequent cases after they have been prepared with Mallory's connective tissue stain. In the present series this was impossible because the sections had not been suitably fixed.

None of the commoner forms of degeneration were present in the musculature of any of my cases. So that the myxoid degeneration found by Dunning in his series cannot be regarded as constant. Edema was present a number of times, but as it must be regarded as the result of congestion it was not recorded. It did not occur in either of the three myopathic cases.

CONCLUSIONS.

1. Metrorrhagia myopathica stands for a *distinct class of cases*, which have heretofore been variously and incorrectly grouped under apoplexia uteri, endometritis senilis and preclimacteric bleeding.

2. Metrorrhagia myopathica is a symptom immediately dependent upon an anatomical or a physiological lesion of the uterine muscle.

3. No anatomical lesion has as yet been demonstrated, but it will probably be found in the elastic tissue constituents of the vessel walls and the subserous and supravascular layers.

4. The physiological lesion is most likely an insufficient contractile power of the uterus. It is possible that the condition is purely functional and that there is no anatomical change which can be recognized.

5. In cases of metrorrhagia myopathica the uterus is enlarged and softened; the os is patulous.

6. Metrorrhagia myopathica does not occur in nulliparous women and therefore it must have some connection with the child-bearing process.

7. The diagnosis of metrorrhagia myopathica is only justified when all other possible causes for uterine hemorrhage have been excluded. This cannot be too strongly urged, especially in reference to carcinoma.

8. The terms apoplexia uteri, senile endometritis, and preclimacteric bleeding as applied to these cases are incorrect and unscientific.

9. While curettement, atmocausis, etc., has little effect in cases of metrorrhagia myopathica, palliative measures should always be tried before adopting hysterectomy.

Obliteration of the endometrial cavity by means of destructive atmocausis is the alternative of hysterectomy in these cases. It is, however, I believe, harder to perform correctly and more dangerous than hysterectomy, which is the operation of choice.

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A CLINICAL STUDY OF THE COMPLICATIONS ARISING IN SIXTY-THREE CONSECUTIVE CASES OF OVARIAN TUMORS WITH SPECIAL REFERENCE TO MALIGNANCY.

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It is the intention in this paper to take up the complications occurring in sixty-three consecutive cases of ovarian tumors. Simple retention cysts, even when of moderate size, are not included in this list. Malignancy being by far the most frequent and important complication, if complication it may be called, will be taken up first.

Malignant growths of the ovaries may occur in two ways; either the ovary may be primarily attacked by a malignant growth, the organ previously having been healthy, or a hitherto benign ovarian cyst which has been present for years may become the seat of a carcinomatous change. No reference will be made in this paper to metastatic new growths of the ovary. There will undoubtedly be many cases of malignant disease of ovaries which will not come under observation until so far advanced that it will be impossible to state definitely the original condition of the ovary at the time of the beginning of the malignant process. In a general way, however, it may be stated that those cases in which the specimen is very hard

and indurated are more apt to have been primarily a malignant process, while those specimens which are very cystic with comparatively thin walls are more apt to have originated as a benign cyst. The history of the cases will often aid in deciding this point, as in Case No. 6 the patient had been suffering from the symptoms of a cyst, mainly pressure symptoms, for nearly ten years; it is certain that if this case had originated as a malignant growth the patient would have succumbed before the expiration of this length of time; and lastly, a careful microscopical examination will frequently reveal the type of the original growth. The prognosis is probably rather more favorable in those cases in which carcinomatous degeneration occurs on an originally benign ovarian cyst, than where the disease is primarily malignant.

The frequency with which malignant diseases of the ovaries occurs varies considerably with different operators, as a glance at the following table will show:

Olshausen finds	15	%	of all ovarian tumors malignant.			
Schroeder	"	16	%	"	"	"
Fritsch	"	18	%	"	"	"
Leopold	"	23	%	"	"	"
Kelly	"	8	%	"	"	"
Freund	"	21	%	"	"	"
Werder	"	15.3	%	"	"	"

By adding seven exploratory laparotomies performed for this condition, 20.4% is reached in his series. This, Werder says, does not represent the full percentage, as there were many inoperable cases.

In a series of sixty-three cases of ovarian tumors operated on in the Gynecological Department of the University Hospital since 1899 there have been ten cases of malignant disease of the ovaries, giving a percentage a little over 15.8 per cent. This, as in Werder's series, does not represent the full per cent. of malignancy, as there were several inoperable cases.

In our laboratory the classification suggested by Orthman has been adopted, and has been followed in these cases.

Although parovarian cysts are not true ovarian cysts, still as their clinical symptoms closely simulate those of ovarian cysts and the complications are practically the same, it has been deemed best to include them in this series.

Case No. 1. Pathological No. 302.—Age 50 years. Adenocarcinoma glandulare cysticum ovarii; right side. Cystadenoma

ovarîi pseudomucin glandulare, left side. Macroscopically and clinically this case appears to be one of bilateral multilocular ovarian cysts. Both cysts were moderately large and presented no gross evidence of malignancy. On histological examination, however, the cyst which sprang from the right ovary was found to have undergone carcinomatous degeneration. The patient had no symptoms until seven months before operation. The operation performed was bilateral salpingo-oophero-cystectomy. There were no metastases at operation. The patient made a normal convalescence.

Case No. 2. Pathological No. 493.—Age, 60 years. Adenocarcinoma glandulare cysticum ovarîi; bilateral. The specimen represents two ovarian tumors; they are of moderate size and similar in general characteristics; for the main part they are cystic, but many areas of almost stony induration are found throughout their substance. The first symptoms this patient noticed were seven months before the operation. The operation performed was a panhysterectomy, bilateral, salpingo-oophero-cystectomy. There were no metastases present at operation. This patient suffered from an aortic lesion so severe that the medical men who were asked to examine her advised that no operation be performed unless it was a matter of life and death for the patient. Ether was used. She stood the anesthesia well, and at the time of leaving the hospital her heart symptoms were greatly improved. Convalescence was normal.

Case No. 3. Pathological No. 608. Age, 46 years. Adenocarcinoma glandulare cysticum ovarîi; bilateral. The specimen consists of two ovarian tumors. They are moderate-sized, one slightly larger than the other, the greatest diameter of the larger being 31 cm. They have the usual appearance of multilocular ovarian cysts which have undergone chronic inflammatory changes. On section it is found that they are mainly cystic: there are many hard, indurated areas found throughout their substance. The first symptoms noticed by the patient were about six months before the operation. The operation performed was a panhysterectomy, bilateral, salpingo-oophero-cystectomy. There were no metastases noticed at operation. The patient was septic and in a very bad physical condition at the time of the operation. She died thirty-six hours after the operation from peritonitis.

Case No. 4. Pathological No. 666.—Age, 45 years. Adenocarcinoma glandulare cysticum ovarîi. Specimen consists of an ovarian tumor, cystic in character, spherical in shape, its greatest

diameter being 24 cm. The surface shows numerous tags of adhesions. On section the tumor presents the usual appearance of a multilocular ovarian cyst. The first symptoms referable to this tumor were noticed by the patient four months before operation. Operations performed were, right salpingo-oophero-cystectomy, appendectomy, radical cure of bilateral inguinal hernia and myomectomy for a small subperitoneal fibroid. The patient had a normal convalescence.

Case No. 5. Pathological No. 753.—Age, 55 years. Adenocarcinoma glandulare cysticum ovarii. Specimen consists of an ovarian tumor undergoing necrosis due to torsion; greatest diameter of tumor, 32 cm. The tumor is partially collapsed, multilocular, infiltrated with blood and shows numerous adhesions. The uterus accompanying the specimen is somewhat enlarged, and on section shows a new growth at the fundus. The first symptoms noticed by the patient were seven months ago. The operation performed was a panhysterectomy, bilateral salpingo-oophero-cystectomy. This case showed metastases to the uterine body and clinically simulated a suppurating uterine fibroid. Normal convalescence.

Case No. 6. Pathological No. 754.—Age, 68 years. Adenocarcinoma glandulare cysticum ovarii. Specimen consists of a large ovarian cyst undergoing gangrene; greatest diameter of cyst about 35 cm. The uterus accompanying this specimen is enlarged and contains a number of intramural and subperitoneal fibroid tumors. The first symptoms noticed by this patient occurred ten years ago, when the abdomen began to enlarge, and since then has been steadily increasing in size. For the last few days prior to operation the patient has had severe pain over the abdomen and especially in the hepatic region. At operation this latter pain was found to be due to adhesions to the gall bladder and liver. Operation, supravaginal hysteromyomectomy, bilateral salpingo-oophorectomy.

This patient had a normal convalescence, and on leaving the hospital appeared well except for occasional attacks of indigestion. The after-history of this case is that she was nearly well for a year and then began to have persistent diarrhea, and regardless of everything that was done, this continued until her death, about sixteen months after the operation. The probabilities are that this was due to a recurrence of the carcinoma.

Case No. 7. Pathological No. 774. Age, 56 years. Adenocarcinoma glandulare cysticum ovarii. The specimen consists of a small piece of cyst wall excised at operation for diagnostic purposes. The clinical diagnosis before the operation in this case was, large

ovarian cyst; ascites, consisting of thick fluid. At operation the case was found to be inoperable on account of the extremely bad physical condition of the patient while on the operating table; at this time a large amount, fully two gallons, of thick, blood-tinged colloid material was removed. The cyst was densely adherent to the surrounding structures. The patient had a somewhat prolonged convalescence, but finally left the hospital in good condition. About one year after the first operation the patient again presented herself at the hospital, suffering from a recurrence of the previous disturbance. During these twelve months the patient had improved in many ways. It should be stated that the small piece of tissue removed at the first operation showed no evidence of malignancy on careful histological examination. A second operation was performed and the tumor proved unquestionably to be malignant. In view of this fact and the impossibility of entirely removing this growth, which originally sprang from the right ovary, a radical operation was not performed. The convalescence from the second operation was normal. Following convalescence the patient complained of considerable pain through the abdomen, most marked in the lower right quadrant. The x-ray was used and dispelled the pain at once.

Case No. 8. Pathological No. 924.—Age, 22 years. Adenocarcinoma glandulare cysticum ovarii; bilateral. Specimen consists of two medium-sized ovarian tumors similar in general characteristics and presenting the usual appearance of cystic carcinoma of the ovaries. The patient noticed the first symptoms eight months before operation. Operation consisted in a bilateral salpingo-oophero-cystectomy for palliative results only, as it was found that there were numerous metastases, one of which involved the sigmoid flexure near its distal extremity. On account of this and as the intestine was almost entirely constricted, an artificial anus was made in the inguinal region. The patient recovered from the operation and at the end of six weeks was transferred to another hospital.

Case No. 9. Pathological No. 926.—Age, 43 years. Adenocarcinoma papillare ovarii; bilateral. The specimen consists of two similar, medium-sized ovarian tumors, papillomatous in character. First symptoms occurred seven months prior to operation. Supravaginal hysterectomy, bilateral, salpingo-oophero-cystectomy was performed. There were no metastases present at operation. The patient had a normal convalescence.

Case No. 10. Pathological No. 987. Age, 30 years. Adenocarcinoma glandulare cysticum ovarii. Specimen consists of a medium-sized multilocular ovarian cyst, apparently undergoing suppuration. There is one area about 5 cm. in diameter and a few smaller ones which show marked hardness and induration. Right salpingo-oophero-cystectomy. There were no metastases present at operation. This is undoubtedly a case of carcinomatous degeneration of an originally benign ovarian cyst, as the patient has had pressure symptoms and menstrual disturbances for over three years, but for the last four months has been losing weight and strength and has had considerable pain; prior to which time this was not a marked feature, and was of a different character. The thought of malignant disease of the ovary occurred before operation, but after examining the gross specimen it was decided that the cyst was probably a multilocular ovarian cyst undergoing suppuration. The malignant process was only discovered by the microscope after nine blocks had been examined. Some of these sections showed no evidence of malignancy. The patient made an uncomplicated recovery. Examination of this patient four months after the operation showed no evidence of recurrence. Patient had gained in strength and weight and felt well. Death probably from recurrence fourteen months after operation.

Case No. 11. Pathological No. 168.—Adenocarcinoma glandulare, ovarii. Specimen consists of a small ovarian cyst, its greatest diameter being about 12 cm.; it is multilocular; its surface shows many adhesions; throughout its substance are many hard indurated areas. In this case there were metastases to the iliac glands.

Case No. 12. Pathological No. 178.—Adenocarcinoma glandulare ovarii. Specimen represents a large ovarian cyst its greatest diameter being about 34 cm. It presents the usual appearance of a multilocular ovarian cyst.

Case No. 13. Pathological No. 187.—Adenocarcinoma glandulare cysticum ovarii. Specimen represents a moderate-sized ovarian cyst. For the main part the surface of the specimen is smooth, although a few adhesions are seen on its posterior surface. The walls are moderately thin; there are two or three hard indurated areas; histologically these areas show carcinomatous change.

Case No. 14. Pathological No. 185.—Adenocarcinoma glandulare cysticum ovarii. Specimen represents a moderate-sized ovarian cyst, similar in general character to the case repre-

sented by Pathological No. 187; but this case shows more numerous and larger areas of hardness.

Case No. 15. Pathological No. 186.—Adenocarcinoma glandulare cysticum ovarii. Specimen represents a rather small ovarian tumor, for the most part hard to the touch, although a few cystic areas are present.

The last five cases are museum specimens only. The clinical history being unknown, they are added to this list to show how difficult and in many cases, impossible it is to detect a malignant process in an ovarian cyst, from the gross appearance of the specimen. These cases are, of course, not included in the sixty-three cases of ovarian cyst from which the statistics in this paper have been drawn.

All the specimens from the above cases were subjected to a rigid microscopic examination, the routine calling for at least two blocks from each tumor, and in some cases ten or twelve were taken; the advantage of this routine being shown in the fact that in a large number of these cases a positive diagnosis could not have been given without the aid of the microscope, and in one or two cases malignancy was not even suspected until a histological diagnosis had been made.

Of these 16 cases, 6 were bilateral, 4 were bilateral carcinoma, while 2 showed a benign multilocular cyst on one side and carcinoma on the other; of the 10 remaining, 6 originated in the right ovary and 4 from the left side. In this series there were 3 large cysts, 10 medium-sized and the remainder small. The question as to how many of these 10 cases were originally benign and how many were originally malignant it is impossible to answer positively; but upon careful study of the histories and of the specimens it would appear that 4 cases were originally malignant, that 4 were carcinomatous degeneration of an originally benign ovarian cyst, and in the 2 remaining cases the type of the original growth is in doubt. The age of the 10 patients varied from twenty-two to sixty-eight years; the average being a little over forty-six and a half years. Two of the patients were under thirty years of age, showing that this condition not infrequently occurs in young women.

Two of these 10 cases showed metastases at operation, one to the body of the uterus and one to the mesenteric glands and intestine; in the latter, the tumor was densely adherent to the intestines and mesentery.

In this series there was an operative mortality of 10 per cent.

The one death occurring (Case No. 3) in a case that was already septic before operation, and in which the general condition of the patient was extremely bad. This patient died at the end of thirty-six hours from peritonitis. In Case No. 8, in which an inguinal colostomy was performed, the patient was transferred to another hospital six weeks after the operation. The remaining 8 cases left the hospital in good condition. The operative mortality in any large series of cases will probably be considerably larger than ours, 10 per cent., as is shown by the following statistics:

Cohn reports 100 cases of malignant disease of the ovaries operated on in Schroeder's clinic; there was an operative mortality of 20 per cent.; 15 per cent. soon succumbed after operation to disease, but 10.5 per cent. were living at the end of one year. In 5 per cent. the cure was maintained at the end of three to five years. Fritsch and Leopold soon followed with as good reports. Kratzenstein gives the results of 100 cases treated at the Universitäts-Frauen-Klinik in Berlin between 1879-92, in which a subsequent course is known. In this series the operative mortality was 28 per cent.; of the remaining 72, 34 died from recurrence, and 36 were permanently cured. In Werder's excellent paper, upon malignant disease of the ovary, he reports 20 cases subject to radical operation; there was a mortality of 15 per cent., 7 of these deaths were due to recurrence and 1 was in doubt. In our series of 10 cases, which are the entire number of this condition occurring in 1,588 consecutive gynecological cases, there were no cases of sarcoma of the ovary, showing that this disease is a comparatively rare one. L. Pick, in 1894, collected 23 such cases; 12 of these were round-celled sarcoma; 10 of the 23 were under 20 years of age, and 6 of these had had round-cell sarcoma; 9 of the 23 were bilateral affections, and 6 of the 9 were round-celled sarcoma. One of his own cases had had constant symptoms for a year and a half, but at operation there were no metastases; this was a case of round-celled sarcoma; and Pick, as a result of his study of these 23 cases, draws the conclusion that the disease frequently occurs in young women, and that metastasis often does not occur until late.

In a recent article Pick has changed his views in regard to the classification of some of these tumors; he has come to the conclusion that one of these tumors is not a true sarcoma, but is a teratoma; he has positively identified certain cells as

Langhan's cells, syncytium and trophoblasts. The examination shows the tumor to be a teratoma with endodermal (glands lined with goblet cells) mesodermal (sarcomatous connective tissue) and ectodermal (central nervous system and chorio-epithelial tissue) constituents. Pick has given the name, epithelioma chorioectodermale to this variety of tumor. Landau reports five such tumors; all of these occurred in young girls. The tumors are clinically very malignant. All the patients have died but one who was alive nine months after the operation. Three patients had metastases to the lungs. These tumors, epithelioma chorioectodermale, may be regarded as a teratoma in which there are chorio epithelial elements which have developed to the exclusion of the other kinds of tissue found therein. In their metastases they resemble chorio epithelioma rather than carcinoma in that they are distributed through the blood vessels and not through the lymphatics. All the tumors reported by Landau were unilateral; three of the tumors were solid and two more or less cystic. The largest tumor was the size of an adult head; all the tumors were rounded and showed lobulation on their surface. Concerning the frequency of this growth Landau mentions twenty-eight solid ovarian tumors removed in his clinics which have been subjected to careful histological examination; fifteen of these were fibrosarcoma or spindle-celled sarcoma; one was a mixed sarcoma; two were small round-celled sarcoma; four were endotheliomata in the sense of Marchand and Pick. Five or perhaps six belong to the epitheliomata chorioectodermale, or about 15 per cent. of growths hitherto called "alveolar sarcoma with carcinomatous-like structure" or "endothelial tumor rich in glycogen" are really of this newly described type. Schmaus reports a tumor which from his clinical and histological description closely resembles this newly described variety, but he believes it to have been a peculiar transformation of an ordinary carcinoma.

Ohl, Cohn, Olshausen, Pick and Kratzenstein agree that the prognosis for ultimate cure of cases of sarcoma of the ovary is very much more favorable than is the prognosis in cases of carcinoma of the same organ. Pfannestiel in a recent article says that he believes there are about 30 per cent. of permanent cures resulting from operation on cases of sarcoma of the ovaries. He further says that the fibrosarcoma is quite benign; next comes the spindle-celled, but that the soft, round-celled sarcoma are very malignant.

In taking up the subject of the papilloma of the ovaries or what Kelly terms the clinically "semi-malignant tumors of the ovaries," it is found that there are 13 cases of this condition in the 63 cases of ovarian tumors from which the statistics for this paper were derived. Of these 13 cases only one has been histologically or clinically malignant; this case is No. 9. Regarding the frequency with which adenocarcinoma is associated with papilloma there is much difference of opinion; some authors claiming that 50 per cent. of all papilloma are malignant, while others hold that it is a very much smaller proportion. Kelly found the condition present in 2 out of 27 cases which practically conforms to the per cent. found in this series. Pfannenstiel found 20 cases of adenocarcinomatous papilloma of the ovary in 43 cases. The fact that benign papilloma of the ovary frequently present the gross appearance of adenocarcinomatous papilloma should not be lost sight of in operating for this condition, and all efforts should be made to remove the growth even if it is thought to be malignant. It is necessary to make a careful distinction between general carcinomatosis of the peritoneum, which take place through the blood vessels and lymphatics, and "contact growths" which result from direct implantation upon the peritoneum, this latter process frequently being benign and, as Pozzi has pointed out, may be compared in many cases to papilloma and warts of the skin. This important distinction was long ago pointed out by Freund, but is at present too frequently disregarded.

In examining the reports of any series of operation for papilloma of the ovaries it will be found that there are many cases in which the primary growth is removed, but contact growths on the peritoneum have been left, and that these cases have recovered and had no recurrences.

Regarding the advisability of operating on all cases of malignant disease of the ovaries in which the entire new growth can be removed there is no difference of opinion; but the question of operating upon the so-called "border-line cases," in which it is doubtful if the entire growth can be removed there is great diversity of opinion. These "border-line cases," when of carcinomatous origin, almost certainly die either from the direct effects of the operation, these cases seeming to be peculiarly susceptible to infection probably because in the majority of these cases there has been a moderate or long-standing ascites and the absorbing properties of the peritoneum have been much

reduced; or more frequently they die from a recurrence of the original growth. On the other hand, those cases of papillomatous origin usually recover. The fact that the diagnosis between these two conditions before operating is frequently not possible should lead the surgeon to operate on these cases and give the patient every possible chance. It should also be remembered that in those cases which have originally been benign tumors, but which have become malignant, the malignant process at the beginning is very limited and may be entirely removed, while it may be impossible to remove the entire original growth. Even in cases supposed to be totally inoperable from the standpoint of removing the entire malignant growth it is doubtful if operations should not be performed; for diagnostic purposes and because operations will not infrequently give a very marked temporary relief from symptoms, as in Case No. 7, where an exploratory laparotomy was performed and ascites removed, the operation gave the patient nearly one year of relief from hitherto painful symptoms; also in Case No. 6, the patient was nearly well for one year, also see case No. 10.

In quite a large porportion of cases of benign papilloma of the ovaries in this series it was impossible to give a positive diagnosis until the specimen had been subjected to a microscopic examination; for this reason also the patient should be given the benefit of the doubt.

The complications which may occur in any given case of ovarian tumor are very numerous. The most frequent and most dreaded, with the exception of malignancy, is torsion. It would be impossible and tiresome in a paper of this character to give an individual history of each complicated case, but an endeavor will be made to give a general description as to the size, adhesions and other causative factors occurring in each such case. The number of each variety of ovarian cyst, classified according to Orthman, is as follows:

- 19 parovarian cysts.
- 5 teratoma cysticum ovarii.
- 1 teratoma solida ovarii.
- 2 cystadenoma ovarii serosum papillari petripicans.
- 9 cystadenoma ovarii pseudomucin papillare.
- 15 cystadenoma ovarii pseudomucin glandulare.
- 1 adenomacarcinoma papillare ovarii.
- 10 adenocarcinoma glandulare cysticum ovarii.

Or, under a broad clinical classification, there are:

- 19 parovarian cysts.
- 6 dermoids.
- 13 papillomata.
- 15 multilocular ovarian cysts.
- 10 adenocarcinoma, either primarily carcinoma or a carcinomatous degeneration.

In examining this series of cases it is found that the three most important complications occurring in it, with the exception of malignancy, are torsion, rupture and suppuration.

Torsion may occur in two ways, either a sudden twist of the pedicle practically cutting off the entire blood supply, causing intense symptoms of shock, soon followed, unless operative interference is at once instigated, by peritonitis and death; or what is more common, a twist of the pedicle may occur not entirely shutting off the blood supply, but pathologically causing marked engorgement of the cyst, because of the veins having thinner walls than the arteries and are therefore more easily shut off, and clinically causing the symptoms of more or less marked peritonitis. It should be borne in mind in regards to the peritonitis resulting from rupture or torsion of an ovarian cyst that it is a mechanical peritonitis and not bactericidal; at all events this is usually the case in its early stages. This fact has been pointed out by Beyea.

Munde has drawn attention to the fact that large ovarian cysts usually have thick broad pedicles and that the cysts more or less entirely fill the pelvic and abdominal cavities, and therefore are less liable to torsion than small cysts.

The cases in which torsion is most likely to occur are those in which the cyst is small, in which the pedicle is long and thin, and in which the abdominal walls are relaxed. The irregular shape, such as is frequently seen in multilocular ovarian cysts, is also probably a causative factor, especially as the tumor grows and is forced out of the pelvis past the promontory of the sacrum, it can easily be imagined how an irregularity in its outline may cause it to twist. It is believed by some that the peristaltic movements of the intestines and their frequent gaseous distention in conjunction with small tumors, which have long pedicles, allowing them to rise out of the true pelvis, play an important part in the causing of torsion. The gradual growth of a uterine fibroid or of a pregnant uterus or the sudden

emptying of the latter, are also causes. Munde reports a case in which he caused torsion by a bimanual examination. Accidental jars or shocks or the lateral recumbent position may also cause this condition. In one of the cases to be reported in this paper the patient was awakened from sleep by a sharp abdominal pain, which was soon followed by other symptoms of torsion; at operation the diagnosis was confirmed. The woman had felt perfectly well before going to sleep. Untwisting of a pedicle may occur from the same causes which brought on the original torsion, but it is hardly necessary to say that such a condition is so rare that it should not be considered in the treatment of a case.

The most frequent form for torsion to assume is for one twist to occur at a time and for each twist to cause an attack of peritonitis. Without a pelvic or abdominal examination, the symptoms arising from these attacks are not unlike an acute attack of appendicitis, but in this latter condition the pain is more frequent, or at all events in the beginning, situated over McBurney's point, while in a cyst it may originate in any part of the lower abdomen. The diagnosis should usually be easy. Munde gives the following excellent clinical description of torsion:

"A moderate distention of the sub-umbilical region, with greater prominence either in the median line or on either side; rapid formation of the swelling, which, perhaps, was merely noticeable before; more or less tenderness on pressure; tense but distinct fluctuation with single or interrupted wave, according as the cyst is single or multilocular; outlines of swelling generally distinct, but sometimes diffused; dullness on percussion over area of swelling; tumor palpable through anterior vaginal vault and continuous with supra-pelvic swelling; uterus generally posterior to vaginal swelling; fluctuation wave in vagina continuous with abdominal wave; temperature somewhat elevated, perhaps 102 degrees; pulse rapid and small; general depression; anxious countenance. The attack has usually come on suddenly and may have been preceded at an interval of several weeks or months by a similar or less marked seizure, attended by severe pain."

It is not uncommon in cases in which torsion has occurred to find the cyst occupying the opposite side of the abdomen, from which it originally sprang. Torsion should always be borne in mind in cases of sudden abdominal pain occurring in women

known to be suffering from an ovarian tumor. Torsion occurs in about 24 per cent. of all cases of dermoid cyst of the ovary. Olshausen many years ago pointed out its frequency in this condition. In the series of 63 ovarian tumors reported in this paper, torsion occurred 10 times, or in nearly 16 per cent. of all cases, occurring in the different variety of cysts, as follows:

Five times in 15 cystadenoma ovarii pseudomucin glandulare.

Twice in 9 cases of cystadenoma serosum glandulare.

Once in 2 cases of cystadenoma ovarii serosum papillare petripicans.

Once in 5 cases of teratoma cysticum ovarii.

Once in 10 cases of adeno-carcinoma glandulare cysticum ovarii; or, according to the clinical classification, torsion occurred:

Seven times in 15 cases of multilocular ovarian cyst.

Once in 6 dermoid cysts of the ovary.

Once in 10 adeno-carcinomatous cysts of the ovary.

Once in 13 papillomatous cysts of the ovary.

Four of these 10 cases in which torsion occurred were large cysts; five were medium-sized, and but one was small. This proportion is rather unusual, as has already been stated; torsion is usually supposed to be more common in small cysts. A large cyst in this series is one which has for its greatest diameter a measurement of 35 cm. or more; a medium-sized cyst is between 20 and 35 cm., and a small cyst below 20 cm. It is worthy of note that in 19 cases of parovarian cyst there was none with twisted pedicle, in fact none of the parovarian cysts showed any serious complications. In 10 cases of adeno-carcinoma there was but one case showing twists in the pedicle; this may, in part, be accounted for by the fact that the malignant tumors of the ovary are much more frequently adherent to the pelvis, and in this way may be prevented from twisting to some extent. But one of these 10 cases of torsion was bilateral, and in this the twist occurred on one side only, bearing out the belief that on account of the limited space bilateral cysts are less liable to torsion than single ones. Seven of these cases of torsion occurred in the multilocular ovarian cyst, giving a proportion of nearly 50 per cent. in this variety of tumor. Three of the 10 cases showed rupture at operation, nine of the 10 cases showed more or less marked peritonitis; three of the 10 cases were in extremely bad condition at operation, having high temperature, rapid pulse and extreme general weakness,

requiring most active stimulation at and following operation. In one of these patients the entire operation was performed under local anesthesia, the patient's condition being such that general anesthesia would probably have proved fatal. In another of these cases the operation was almost entirely performed under local anesthesia, ether being given during the last few minutes of operation.

Despite the bad general condition of these patients, and the fact that nine of them were suffering from peritonitis, there was no operative mortality, all the patients leaving the hospital in good condition. This fact seems to the author to strongly bear out the assumption that the peritonitis produced by torsion is mechanical and not bactericidal, at all events in its early stages.

Among the 63 cases of cysts comprising this series, there was but one case of rupture uncomplicated by torsion. This case, apart from the rupture, presents some very interesting features. Three years before the rupture occurred the patient was operated on at the University Hospital for what proved to be a right-sided multilocular ovarian cyst (cystadenoma ovarii pseudomucin glandulare) of medium size. At this time the left ovary was examined and appeared entirely normal. Convalescence was normal. Three years after the first operation she was brought to the hospital with all the symptoms of a ruptured ovarian cyst of medium size; this diagnosis was confirmed at operation, the cyst having sprung from the left side. The specimen appeared to be a collapsed multilocular ovarian cyst containing pseudomucin. Malignancy was strongly suspected on account of the history, but although numerous sections were taken from the specimen for histological examination, no malignant process was found, the cyst proving to be of the cystadenoma ovarii pseudomucin papillare, teratomatous, variety. At the time of this patient's second operation her general condition was very poor and the abdomen was filled with pseudomucinous material. There was no evidence of torsion at operation. The symptoms had come on suddenly after lifting a heavy weight. This case shows how quickly even a benign ovarian cyst may develop and grow, the ovary from which this cyst sprang having been apparently normal three years before.

In this series of cases there is but one case of suppuration of an ovarian cyst uncomplicated by torsion. This occurred

in a woman 55 years of age, the cyst being moderate in size. She was brought to the hospital in an acute septic condition; there were high temperature, rapid feeble pulse, and all the symptoms of acute peritonitis. The diagnosis was made of a suppurating ovarian cyst; at operation this was confirmed; the abdomen was filled with foul pus, the cyst on histological examination proved to be of the cystadenoma ovarii serosum glandulare variety. There was no torsion; symptoms had come on rather suddenly, three days prior to operation. Death resulted on the third day following the operation from peritonitis. Whether this case was one of rupture, followed by suppuration, it is impossible to state definitely, but from a careful examination of the specimen, both in its gross state and from histological preparation made from it, it seems to be one of suppuration, probably resulting from poor blood supply of the tumor.

In the 63 cases there were 41 cases which showed more or less marked adhesions; in 16 of these 41 cases the adhesions were so dense as to seriously complicate the operation. The 41 cases of adhesions probably do not represent by any means the entire number in which adhesions were present, as in many of the case histories no reference is made to this condition.

Ascites occurred in this series of 53 cases (the 10 malignant cases being excluded) twice, both times with large cysts and both times with cysts of the multilocular ovarian variety (cystadenoma ovarii pseudomucin glandulare). Hemorrhage occurred in the entire series of 63 cases twice; this does not include small hemorrhages occurring into one or two loculations of a multilocular ovarian cyst.

Hydroureter, as a result of pressure, occurred twice, in one case being bilateral, and in the other unilateral.

Exclusive of the complications which were directly caused by the tumor, there were 27 other complicated cases; these complications occurring independently of the tumor, such as pregnancy, fibroid tumors of the uterus, inflammatory disease of the tubes and ovaries, endometritis, appendicitis, movable kidney, etc. Whether many of the inflammatory conditions were actually or indirectly the result of the ovarian tumor, it is impossible to state, but it would seem that in a certain proportion at least that this was the case. Among the more rare complications which have been mentioned by other authors in regard to this subject and not found in this series and which

may be regarded more as surgical or pathological curiosities are: Fusion of two originally separate ovarian cysts; entire calcification or ossification of the tumor. Of course a moderate degree of calcification is very common and occurred in quite a large per cent. of cases in this series. Bolt has called attention to cardiac neurosis in connection with ovarian tumors, and believes that this is not an infrequent condition; his studies cover 2,000 cases. This condition was not noticed in any of our cases. Bennet in 1848 reported a case of cure of an ovarian cyst by means of an ulcerative opening of the cyst into the bladder; also numerous cases have been reported cured by absorption; but if this ever occurs it must at least be very rare. Baldy reports a case of an ovarian cyst protruding through the inguinal canal. A number of cases of intestinal obstruction, the result of an adherent gut, combined with torsion of the cyst, or the result of a loop of intestine being caught in a long pedicle and becoming strangulated in this way, have been reported. Among the first to report such cases were Kokitansky, Hardy and Ribbertrapp. Infection of an ovarian cyst by the micro-organisms of an intercurrent disease, such as typhoid fever or pneumonia, have been reported.

It has been the author's intention in this paper to urge the necessity of early operation in all cases of ovarian tumors, unless there is some strong counter indication for the same. It has been shown that in these 63 consecutive cases of ovarian tumors that there were 10 cases (15.8 per cent.) of malignancy, 10 cases of torsion, one case of rupture and one case of suppuration. In other words, there were 21 cases (one case of malignancy being combined with torsion), which would surely have died in a short time without operation; how many of the remaining 42 cases would have developed some fatal complication if operative means had not been adopted, it is impossible to say.

In these 63 cases operated upon there were two deaths, one occurring in a case of suppuration of a benign ovarian cyst, and the other in a case of malignant disease. Both were in bad condition before operation and extremely septic. The operative mortality for the 53 benign ovarian cysts is therefore a little less than two per cent., and the operative mortality for the entire series being about 3.17 per cent.

Conclusion.—As regards malignancy.

(1) That one in every four to six cases of tumor of the ovaries

is malignant, and that this proportion is sufficient to warrant the treatment of all cases of ovarian tumors as malignant until proved otherwise.

(2) That the operative mortality in cases of malignant disease of the ovaries should not be above 10 or 12 per cent. That the number of cures at the end of five years will be relatively small. That carcinoma is by far the most frequent and most dangerous of the malignant diseases of the ovaries, and that the recurrences will be largely due to this condition.

(3) That every case of ovarian tumor should be operated upon at once, unless there is some strong counter indication for the same.

(4) That the so-called "borderline cases" should be operated on because the case may present all the clinical evidences of malignancy, and on operation may prove benign, or the gross specimen may even, together with the clinical symptoms, appear malignant, and on histological examination prove benign; this is especially true of the adeno-papilloma, which frequently grossly and clinically so closely resemble adeno-carcinomatous papilloma.

(5) That an exploratory laparotomy and the removal of ascites will make many cases more comfortable, and should certainly be performed when there is any doubt whatever as to the absolute diagnosis of malignancy.

(7) That all ovarian tumors should be subjected to a rigid microscopic examination, and in cases in which there is any doubt as to the character of the tumor, a large number of sections should be taken; and that this routine probably in part accounts for the high per cent. of malignancy occurring in the series of ovarian tumors reported in this paper.

Further conclusions:

(8) That parovarian cysts are far less dangerous than true ovarian cysts. In this series of 19 consecutive cases of parovarian cysts there were no complications and no malignant degeneration.

(9) That torsion, next to malignancy, is the most frequent and dangerous complication occurring in ovarian tumors, and that it occurs in a mild form more often than is generally supposed.

(10) That in the 63 cases which have been reported, 33.33 per cent. would surely have died within a short time without operation.

(11) That the operative mortality for all ovarian cysts should be under 8 or 10 per cent. In the above series it was 3.17 per cent. That the operative mortality for benign cyst will be much less, in this series it was less than two per cent. That the operative mortality for malignant tumors of the ovary should certainly be under 10 or 15 per cent, and that early diagnosis and immediate operation on all new growths of the ovary will greatly reduce this proportion.

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INJURIES TO THE CHILD INFLICTED AT BIRTH

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THE injuries, great and small, to which the child is exposed during parturition, are very frequently met with, but the varieties of these lesions are not numerous and may easily be classified upon an etiological basis. Again and again we witness exactly the same injury occurring under the same conditions. It becomes highly important then for the obstetrician to study his cases carefully, so that he readily may comprehend the nature and cause of the lesions which he encounters, and learn to prevent them as far as possible. What renders this consideration of greater importance is the fact that we are often called upon to deliver the successive children of the same mother, all of whom are exposed to the same dangers.

Inasmuch as few of our writers on obstetrics pay much attention to the subject of these birth injuries, I have thought it would prove interesting to take up the more typical ones and consider them, as the logicians say, "*a posteriori*"—from effect to causes. As my personal observations have been somewhat limited I have borrowed most liberally from the excellent article on this subject by Prof. Küstner, of Dorpat.

Injuries occurring in cases of spontaneous birth are attended by less traumatism than is found after instrumental and manual extraction. Furthermore, the skillful obstetrician is able

to avoid many of the errors of the tyro, especially when, as in hospital practice, he is surrounded by able assistants.

INJURIES AFFECTING THE HEAD.

Slight injuries, such as erythema and abrasions of the integument, are of frequent occurrence and may be produced by contact of the head with projections into the birth-canal; they also may be caused by manual interference on the part of the obstetrician, and most of all by contact of the forceps in instrumental cases. If they are symmetrical in appearance and affect both cheeks of the child, it follows that the forceps was applied to a normally rotated head. If the marks involve one cheek or the region of the eye on one side, and the occiput or the neck on the other side, we may know that the forceps was applied to the head as it lay obliquely in the pelvis; *i. e.*, in a position of incomplete or abnormal rotation.

In non-instrumental cases, and especially in cases of contracted pelvis, the head may have undergone long continued pressure from the maternal parts, with resultant necrosis of superficial character. A study of injuries thus produced often gives us insight into the cause of the obstructed labor. The sacral promontory is the part most apt to mark the child's head. In the case of a pelvis with diminished conjugate diameter, *i. e.*, a flattened pelvis, we are very apt to find one or more marks on the head, produced in this manner. There may be merely one mark, or, if the attitude of the head was changed while at the pelvic inlet, there may be more than one. The promontory generally marks the head in the region of the parietal bone, though the cheek may also be involved. In such cases the mark on the parietal bone runs somewhat parallel with the coronal suture, the mark on the cheek being a continuation of the parietal mark, and is usually joined at an obtuse angle with the former. Such an angular mark is produced by change in the attitude of the head, the frontal mark being made first and then the child's head becoming more flexed upon the chest, the promontory marks the cheek as the head slips into the pelvic excavation. We sometimes find parallel marks on the side of the head. These may be produced by successive contacts of the head with the promontory or by pressure produced by a true and a false promontory. Sometimes in cases of flat pelvis a mark is produced upon the forehead or cheek by the pubic bones. In justo-minor pelvis

irregular atypical marks are produced, which may affect any part of the head. In cases where the child is extracted by the breech, we do not so often find these pressure marks, for in those cases the head, as a rule, passes through the pelvis much more rapidly than in cephalic presentations.

CAPUT SUCCEDANUM.

This is a serous infiltration of the presenting part of the child. It appears most often upon the scalp, but the term is also employed in connection with swellings upon the face or buttocks when these are the presenting parts. The condition is one of little importance to the well being of the child, but it affords the obstetrician a useful sign in estimating the progress and character of the labor. In left occipito-posterior presentations it is found at the right anterior part of the head; in right anterior presentations it is found at the left posterior part of the head, etc. The caput succedaneum rarely appears until the membranes are ruptured and is more marked in proportion to the duration of labor.

CEPHALHEMATOMA.

This is a tumor produced by escape of blood between the pericranial membrane and the underlying bone. While seldom causing any difficulties, it presents many points of interest. It is to be noted that it is usually single, rarely double; that it is confined to that bone in which it originated because the pericranium is more firmly attached at its borders, hence the tumor does not cross a suture. The effused blood in the tumor may remain fluid for weeks.

Concerning the mechanism of its production we find several theories: Some regard it as the result of pressure on the part of the cervix; others as the result of pressure exercised by any part of the birth canal. Fritsch is of the opinion that the trauma involved in its production occurs at the moment when, the labor pain ceasing, recession of the head takes place, the head itself receding, while the pericranium is sufficiently held by the walls of the birth canal to cause rupture of the pericranial vessels and a gradual stripping off of the pericranium itself. This theory suffices to explain the presence of cephalhematoma after easy labors and also its relative frequency of appearance over the right parietal bone.

Küstner believes that a certain number of cephalhematomata

are caused by a minute fracture of the cranial bones because in cases of important cranial fractures a subperiosteal hemorrhage usually occurs. Furthermore, the peculiar radiating structure of the bones of the head renders them especially vulnerable as seen most markedly in the case of premature children. Cephal-hematomata are sometimes formed at the point where the apex of the forceps has impinged upon the bone and likewise where a cranial bone has been exposed to fracture by pressure upon the pelvic bones. Finally, autopsies have revealed subcranial hemorrhages corresponding with external hematomata, and in some of these cases a traumatic injury of the bone was found while in other cases there was a congenital non-traumatic fissure of the bone. Cephalhematomata so seldom cause trouble that it is usually advised to employ no treatment for their cure, though some have resorted to aspiration followed by compressive bandaging. When resorption of the effused blood begins, new bone is formed around the periphery of the tumor, the latter itself becoming softer. One often obtains upon examination a feeling as though there were present a depressed fracture of the skull. I have several times seen these mistakes made by internes and others and can now recall two cases of hematoma occurring in children several years of age where operation had been advised for the purpose of raising a supposedly depressed bone. One case was that of a child 4 years of age who had fallen from a moving carriage. After some days the child was brought to me. The mother stated that a physician had advised trephining. I found a soft, moderate sized tumor with a raised edge formed by the new deposit of bone. I advised no active treatment and the tumor disappeared in a short time. Another case was that of a six-year old boy who had fallen from his bicycle to a stone pavement, sustaining a severe contusion upon the forehead. A very large hematoma had formed and a physician, after unsuccessfully attempting to remove the blood by aspiration, had advised trephining. I advised making moderate compression of the tumor by bandaging, which appeared to facilitate resorption. In later years this child suffered from purpura hemorrhagica in aggravated form.

DEPRESSIONS IN CRANIAL BONES.

We encounter two forms—the deep spoon-shaped and the shallow gutter-shaped depressions. The shallow depressions are most frequently found in cases of flat pelvis, and generally

are located on the parietal bone. They are caused by pressure from the promontory, which usually leaves a mark upon the corresponding portion of the scalp. The deep depressions are also caused by the promontory, and are most apt to be found after rapid deliveries, and especially in cases of manual or instrumental delivery. The regions of the head most often affected are the frontal eminence, the parietal eminence, and the parietal bone near the coronal suture. Depressions over the frontal eminence correspond with the forecoming head. Depressions over the parietal eminence correspond with the aftercoming head, while depressions near the coronal suture may be found in both varieties. The coccyx has been known to cause a deep depression. Use of the forceps is a most frequent cause of these depressions, and especially so in cases of the high operation, where the head is necessarily grasped in an asymmetrical manner. Such a case has been described where severe pressure over the frontal bone caused the eye to protrude from its socket. The cranial bones of the new born being exceedingly fragile, depressions are often accompanied by slight fractures affecting more often merely the external table. These injuries do not generally affect vital organs, even the vessels escaping injury, but such a lesion in the temporal region is apt to produce rupture of the meningeal vessels. Disturbances of the central nervous system are seldom produced by even quite deep depressions, and after a few weeks the depressions become shallower, but do not entirely disappear.

As regards attempts to elevate the depressed bone, it is agreed by the authors that inasmuch as severe results seldom follow the injury, the cure is apt to be worse than the disease, and non-operative interference is the safer plan. The harmless advice to attempt the elevation of the bone by means of an air pump has produced but small results.

CRANIAL FRACTURES AND SEPARATION OF CRANIAL SUTURES.

These occur especially in cases of difficult forceps operations, and in cases of manual extractions. They are always accompanied by an extracranial hematoma and generally by an intracranial one as well. When the bones are torn apart at the sutures, there may be laceration of the subjacent sinus with the production of enormous hemorrhage. The above injuries, when caused by the forceps, generally affect the frontal bone; when caused by the promontory, the seat of injury may be

at the parietal or frontal bone. Fracture of the occipital bone is especially associated with extraction of the aftercoming head.

In one of the Vienna clinics I once witnessed a difficult case of version and extraction, in which the child suffered an extensive fracture of the temporal from pressure of the promontory. The child was born dead.

Injuries at the base of the skull are rare and consist mainly in separation of the squamous portion of the occiput from the condyloid portion.

RUPTURE OF INTRACRANIAL VESSELS.

Such injuries are of frequent occurrence, their importance depending upon the locality and extent of the resultant hemorrhage; hemorrhage at the base of the brain being particularly fatal, while hemorrhage in other localities may result in asphyxia of greater or less degree. Laceration of the transverse sinus is usually caused by separation of the parietal bone from the temporal bone, while the longitudinal sinus is lacerated by the tearing asunder of the bones which bound the parietal or sagittal suture. Laceration of the sinuses may occur without separation of the corresponding sutures, owing to the greater elasticity of the soft parts of the sutures in comparison with the walls of the sinuses. Hemorrhages have been observed in cases where, during birth, the circulation was impeded by pressure on the jugular or obstruction to the circulation in the cord.

INJURIES OF THE FACE.

Fracture of the nasal bones may readily be produced by the forceps but has also occurred at spontaneous births. Injuries about the mouth such as lacerations at the angle of the mouth, lacerations of the tongue, dislocations and fractures of the jaw, may all be produced by attempts to extract the aftercoming head in the maneuvers accompanying the Mauriceau grip.

INJURIES OF THE NECK.

Striae are sometimes found upon the skin of the neck, the part most exposed to stretching being the seat of lesion as occurs in face presentations. Hematomata of the muscles of the neck when found are usually in the sterno-cleido-mastoid muscles. Such hemorrhages may be produced by pressure of the forceps

or the operator's fingers against the sides of the neck or by twisting and stretching of the muscles as occurs in extraction by the breech when rotation of the head does not keep up with that of the shoulders. It is known that many of these hematomata disappear without leaving sequelæ, but it is also probable that certain cases of wry neck are directly ascribable to this cause.

DIVULSION OF THE VERTEBRÆ.

Aside from decapitation of the child there is a class of vertebral injuries which have been described both as fractures and ruptures of the vertebræ. The cervical region is the one most apt to be involved, and one or more of the vertebræ may be involved. The typical injury is separation of the upper or lower epiphysis, rupture of the ligaments rarely occurring, the rule being that in all parts of the new born the sutures are weaker than the ligaments. The chief cause of the injury is traction upon the head or body before the soft parts are well prepared, as in a case of version and extraction, where the head is incarcerated by an undilated cervix. The injuries are generally accompanied by hemorrhage into the membranes of the cord. In the lower part of the trunk the sacro-iliac articulation is the most vulnerable point.

INJURIES OF THE SECUNDINES.

As regards the funis, injuries may be caused by tension or pressure. The chief predisposing causes of division of the cord are velamentous insertion of the same and abnormal shortness. In the former case the vessels of the funis may be opened by rupture of the membranes. With regard to abnormal shortness of the funis this may be absolute or relative, the latter being the case when the cord is wound around some part of the child. If the cord is shorter than ten inches, then when the child is expelled either the placenta is loosened by traction or the cord is torn across. Injuries of the cord are especially liable to occur in cases of precipitate labor. It has been found that the cord is able to sustain a weight of about eleven pounds and it is therefore probable that in most cases of labor if the child were to fall to the floor its momentum would suffice to rupture the cord. Hemorrhage seldom occurs under such circumstances both on account of the laceration of the vessels

and because of the fact that blood pressure is lowered in the cord as soon as the respiratory movements of the child begin.

INJURIES OF THE EXTREMITIES.

The most common injury of the upper extremities is fracture of the clavicle. The clavicle may be fractured by direct or indirect force. It may be fractured by direct force when in extraction by the breech the shoulder is pulled down to render the arm accessible, or after extraction of the arms it may be fractured by direct pressure made with the fingers against the bone in the endeavor to deliver the head. I think fracture is often produced by traction made upon the head in the endeavor to deliver the shoulders. In this maneuver the head is forced backward so as to bring the anterior shoulder under the pubic arch. This places the clavicle of the posterior shoulder in a position that renders it peculiarly liable to fracture. Indirect force may also be applied by pressure made upon the shoulder by the hand introduced for the purpose of bringing down an arm, or it may be made by traction on the humerus. The fracture usually occurs at the junction of the inner $\frac{2}{3}$ with the outer $\frac{1}{3}$ of the clavicle. Such fracture in the new-born child appears to cause it but little pain. A suitably adjusted bandage is well borne and satisfactory union is easily obtained.

FRACTURES OF THE HUMERUS.

These are almost always produced by direct force made in releasing the arm in extraction by the breech and particularly so when the attempt is made with one finger, as should not be done.

An equally frequent injury is separation of the epiphyseal end of the humerus at the shoulder. Of special interest is the fact that such injury is apt to be overlooked or mistaken for dislocation, fracture of the neck of the scapula, or most often of all, a nerve lesion. Quite a moderate degree of force suffices to produce this injury, it having been found that a weight of 4.5 kilograms applied to the humerus in a transverse direction is all that the bone is capable of withstanding, while all movements, especially those of rotation, which, in the adult, produce luxation, in the child cause separation of the epiphysis. In injuries of this sort the periosteum is usually torn, and through the opening the diaphysis protrudes, being palpable below the coracoid process or glenoid cavity. The end of the dia-

physis covered by the soft tissues has a rounded feel, and may be mistaken for the dislocated head of the bone, the deception being increased by the changed direction of the axis of the arm. The rounded contour of the shoulder is preserved and affords one of the most valuable signs in making a diagnosis. A striking symptom is the attitude of the arm, which is rotated inward to an extreme degree. The upper fragment, on the contrary, is rotated outward. Union of the fragments in these positions is naturally attended with disastrous results. In older children the inward rotation of the lower fragment is less marked, or even absent, owing to anatomical reasons.

The treatment is such as belongs to the domains of surgery and neurology. The first thing to accomplish is the reduction of the deformity, by bringing the fragment back through the periosteum. The next point is to secure proper union of the epiphysis, which is rotated outward with the diaphysis, which is rotated inward. The forearm should be supinated, then flexed upon the injured upper arm so that the hand rests upon the shoulder. A pad is then placed in the axilla and the forearm and upper arm fixed upon the thorax. The best results, however, are probably obtainable by securing the epiphysis to the diaphysis by means of pegs. For the paralysis, electrical treatment should be begun early. If the injury is caused by pressure of a displaced fragment, electrical treatment is of course useless, until the pressure of the bone is released.

DISLOCATIONS.

We need not concern ourselves greatly with these, because to whatever injury the new-born child is subjected, the suture gives way before the ligaments do. So we may say that epiphyseal separations in the new-born correspond to luxations in the adult. Duchenne described a number of cases, which he regarded as examples of shoulder dislocation, but which Küstner considered to be examples of epiphyseal separation.

INJURIES OF THE LOWER EXTREMITIES.

Excoriations, bruises and deeper wounds may be produced by version and extraction, particularly when the fillet is used. Bone injuries are uncommon, though many varieties have been described. Epiphyseal separations occur in the upper and lower ends of the leg and at the lower end of the femur. Cases of epiphyseal separation have been described where the legs

were so twisted that the feet were turned backward. Inasmuch as it is never necessary to exert force upon the leg in any direction but a longitudinal one for traction purposes, the existence of such injuries is *prima facie* evidence of bad practice. The causes of these injuries are twisting forces and hyperextension, the former of which produces separation of the epiphysis, while the latter may also result in fracture. The least vulnerable point is the lower suture of the femur, the most vulnerable the epiphysis of the leg.

In extraction of the hip, instrumental or otherwise, if the hook or finger employed is not properly applied at the flexure, it is apt to slip off and produce a fracture of the upper one-third of the femur. The femur, like most of the bones of the newborn child, breaks transversely without splintering. In the treatment, extension is as desirable as in the adult. Crede's plan is to flex the thigh upon the body and secure it to the trunk a procedure less difficult, because these fractures occur generally in children born by the breech, who have long been used to carry their legs in this position.

Diaphysis divulsion at the upper end of the femur is scarcely possible, owing to the manner in which the bone is dove-tailed into the cartilage. The only way in which it would be likely to be produced would be by a forced movement such as in the adult produces anterior dislocation, *i. e.*, abduction with outward rotation as might be produced in an awkward version.

Dislocations of the hip joint by obstetrical maneuvers have been described, but are exceedingly rare, although Stromeier reported twenty cases observed by him. It is only possible when with the thigh flexed as in a breech presentation great force is exerted upon the neck of the femur which still appertains to the epiphysis. In this way an iliac luxation might be produced, though the neck of the femur has been shown to be capable of sustaining a weight of thirty to forty kilos without injury to the joint. As soon as force is exerted upon the diaphysis such movements as in the adult would produce luxation in the child cause epiphyseal separation.

BIRTH PARALYSES.

These are cerebral, spinal and peripheral in their origin. They are caused generally by meningeal, less often by cerebral hemorrhage produced by pressure upon the skull, either in normal or instrumental labor. According to Cruveilhier one-third of the

deaths during parturition are ascribable to this cause. The chief etiological factor in the production of these hemorrhages is anything that causes unusual pressure upon the child's brain. Hence they predominate in children of primiparæ and in cases of tedious labor, premature labor, extraction of the after-coming head, forceps extraction, etc., although it is also true that well-advised forceps operations may sometimes prevent such accidents. Cerebral hemorrhage occurs in the great majority of still-born children, and is the common cause of asphyxia neonatorum. As a rule the hemorrhage is at the base of the brain in head presentations and at the vertex in breech presentations. The result of the hemorrhage depends largely upon its extent, though even very large hemorrhages are not incompatible with prolonged life.

According to Church and Peterson the injuries produced by hemorrhages lead to meningo-encephalitis, sclerosis, cyst formation and atrophies. The birth paralyses are usually of the bilateral type, in contradistinction to those of later origin. If the injury to the brain centers be extensive the child is apt to be born dead or profoundly asphyxiated; if the child recovers from the asphyxia convulsive symptoms appear in a few hours or days. In still other cases the injury is not manifested until weeks or months after birth.

The pathological conditions present in all cases of cerebral paralysis are, first, a lesion of the brain usually involving some portion of the motor tract, and, second, atrophy and retarded development of the brain with descending degeneration of the lateral columns of the cord and pyramidal tracts. In the cerebral paralysis of these cases of early origin there is apt to be more mental involvement than in those of later development. The child is irritable and is specially prone to all the functional disorders of early childhood. If the lesion is cortical, epileptic convulsions are common. At the time of dentition the eruption of a tooth is often accompanied by convulsions. The muscles respond to electrical stimulus. The child learns to walk later and then exhibits a peculiar spastic gait due to rigidity of the muscles and spasmodic contractions of the flexors and adductors. The child rises upon the toes and the knees knock together or the legs cross each other as the child advances. Incoordinate movements often occur in the paralyzed limbs when voluntary efforts are made or the continuous movements of athetosis may be witnessed. I have seen cases when all the voluntary

muscles of the body seemed to be agitated by the child's efforts in walking and talking. With all these drawbacks to health such children may maintain a fair degree of growth in spite of the atrophy of various muscles, particularly those of the legs.

PARALYSIS OF THE UPPER EXTREMITY.

Aside from paralyzes of central origin we also find severe injuries of nerves following bone lesions, such as fractures and separation of the epiphyses when the displaced bone presses upon a nerve or a plexus of nerves. Such nerve insults are constant accompaniments of the above-described bone injuries. In the case of the upper end of the humerus Duchenne always found in the cases which he called upper arm dislocations (and which Küstner regarded as epiphyseal separation), a concomitant paralysis caused by lesion of the brachial plexus. Duchenne described a kind of paralysis which he observed in cases where there had been either a difficult extraction of the arm or where the body of the child had been delivered by violent traction, made by hooking the fingers into the axillæ. Duchenne's patients were all seen by him long after the infliction of the injury. The symptoms were always uniform. Exaggerated inward rotation of the humerus with the hand in pronation; paralysis of deltoid, infraspinatus, biceps and brachialis anticus. The muscles did not respond to the Faradic current. Duchenne not having established the lesion, other writers attributed it to injury of the suprascapular nerve. Seeligmüller says the infraspinatus muscle is paralyzed by pressure made upon the nerve which supplies it, *i. e.*, the suprascapular nerve, which is very superficial, and as well as the muscle itself, is exposed to direct pressure against the bones. Küstner says that even if the nerve were superficial, which he denies, he fails to see how one, by hooking his fingers into the axillæ, could possibly injure the nerve in question.

Erb described a paralysis in which the deltoid, biceps, brachialis anticus, supinator longus and infraspinatus were all affected. Erb also described a spot above the clavicle where the brachial plexus could be irritated and all the above-named muscles would be affected. This seemed to offer an explanation of the paralysis, and Erb expressed the opinion that it was produced by the Prag grip, to which Küstner objected that at the time Erb gave his opinion the Prag grip was obsolete. It is also objected that if the paralysis is caused by any of the class-

ical grips Prag, Mauriceau or Smellie-Veit, why is it found on one side only? Schultz's opinion was that in the effort to extract the arm or child the position of the arm was such as to force the clavicle against Erb's point. One of the most remarkable features of this paralysis is the persistency of the injury and the subsequent atrophy, while in Bell's paralysis permanent injury seldom occurs, though in this case the conditions are most favorable. Küstner is of the opinion that most of the birth paralyses of the upper extremities are the results of unrecognized separation of the epiphysis of the humerus with or without protrusion of the diaphysis through the periosteum. At all events, all the severe cases of this sort which he has seen showed recent or badly united epiphyseal-diaphyseal fracture.

Sometimes light cases of this paralysis are seen, which appear to be cases of nerve injury, caused by pressure of a hematoma in the shoulder region, as has been demonstrated by Fritsch.

There are recent contributions to this subject to which I have not had access. Thus, some French writers claim to have demonstrated that the lesion involved in the production of this paralysis consist in an actual separation of the roots of the nerve near the spinal cord.

Two cases of Erb's paralysis, which occurred in my own practice, may be of interest in this connection. The mother of one of these children had given birth to a child now living, which was born about ten years ago. The labor, in which I attended her, was somewhat protracted because of the failure of the head to engage. The latter was in the left occipito posterior position. I corrected the presentation manually and without difficulty. I then applied the forceps and delivered the head quickly and easily. The child showing marked symptoms of asphyxia, I did not dare await spontaneous expulsion of the child's body. I therefore proceeded to extract the shoulders. This was done by forcing the head back toward the perineum to draw the anterior shoulder under the pubic arch. The extraction of the shoulders was accomplished with much difficulty. The child was deeply asphyxiated when finally born, but was resuscitated after some minutes. It was a large, well developed, vigorous girl. A few days later it was noticed that the child suffered considerable pain and was not tolerant of pressure made on the right side of the neck, and also that whereas the left arm was freely moved, the right hung limp at the side. The only injury discoverable was a small swelling back of the

ear, at the point where pressure is apt to cause Bell's paralysis, of which, however, there was no sign. A little later still in the case, all the symptoms of Erb's paralysis were present. A neurologist who saw the case with me when the child was about three months old made a bad prognosis, but I am pleased to state that after a few months the child had greatly improved, and that at present most of the motions of the arm are normal. My own impression in this case is that I injured the brachial plexus in my efforts to release the shoulders, although the maneuver made was, I believe, a perfectly justifiable one; furthermore, I employed no more force in its execution than I often have used in similar extractions.

The second case referred to was that of a child whose mother I had attended in three previous labors. This woman is large, strong and healthy, but has a flattened pelvis, the result of rickets. When her first child was born the first stage of labor lasted three days. The child was delivered with great difficulty, by means of a high forceps operation. The child lived ten days and died of convulsions, produced, no doubt, by cerebral hemorrhage. In the second labor I had to deal with a breech presentation, which I converted into a footling. The extraction was very difficult, but the child is still living and is healthy and vigorous. The third labor was similar to the first. The first stage of labor having extended over two days, and being very exhausting to the patient, I dilated the cervix manually, and with great difficulty made a version. The extraction proved still more difficult, and while the head was still undelivered the woman nearly succumbed to the anesthetic. I was obliged to resuscitate the mother. When this was accomplished I completed the extraction and found the child dead.

The fourth labor was similar to the third except that the first stage was shorter. On this occasion I was better provided with assistants but experienced the same difficulties in the delivery, which was accomplished by version as before. This child is now about one and one-half years old. It was noticed about one week after its birth that it did not use its left arm as freely as the right, and after a few weeks more a diagnosis of Erb's palsy was clearly made out. The lesions in this case, however, were less severe than in the case already cited, and improvement has been so satisfactory that I believe the recovery will be complete if it is not so at this time. In my opinion

the injury to the nerves was inflicted by the efforts made in extracting the head.

In this connection I wish to state that I believe it would have been more prudent to have induced premature labor in the last two instances. The following considerations, however, induced me to act as I did. First, I have observed in similar cases that successive labors have been progressively easier. Second, I had hoped to render labor easier by placing the mother upon a strict diet during the latter part of gestation, which was done. Third, by providing myself with more assistants I believed I would be able to deliver with more facility.

CENTRAL PARALYSIS OF MOTOR NERVES OF THE FACE.

This is caused by hemorrhage at the base of the brain, generally from a fracture of one of the cranial bones. In cases of this sort, then, and especially when in addition we have to deal with a profound asphyxia, we may suspect hemorrhage at the base of the brain interfering with the normal function of the medulla.

PARALYSIS FROM INJURY OF PERIPHERAL NERVES OF THE HEAD.

Of these the most common is Bell's paralysis of the facial nerve, caused by pressure of the forceps against the nerve in its exit from the stylo-mastoid foramen as often happens when the forceps grasps the head in an asymmetrical manner. The symptoms are exceedingly characteristic, for the paralyzed side of the face remains persistently immobile, with the eye wide open, producing a marked contrast with the uninjured side, especially when the child cries. The prognosis is particularly favorable and the function of the muscles is soon restored, notwithstanding the fact that the affected nerve has been subjected to compression between the hard temporal bone and the apex of the forceps. It is to be observed that the forceps whose apices turn in sharply and closely approximate each other is the instrument which is most apt to produce injury of the facial nerve. In my own practice I avoid such an instrument and also take the additional precautions of keeping the apices somewhat further apart by inserting a folded towel between the handles of the instrument.

PREGNANCY ASSOCIATED WITH DIABETES.*

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A STUDY of the literature of pregnancy associated with diabetes is very interesting. The rarity of this condition, as shown by the few cases tabulated, gives but a meager working basis to draw conclusions that will be of much value.

In general practice a case of diabetes is looked upon as serious, in surgery a complication which often forbids even a simple operation, and in obstetrics (if we accept the views as expressed by that master—Mathews Duncan), we are dealing with a grave complication.

Cadges¹ interesting report of the death of Dr. Hughes Bennett from exhaustion and sudden collapse the tenth day following an operation—lateral lithotomy for stone in the bladder—shows how rapidly a fatal termination may ensue when diabetes complicates a surgical operation.

Griesinger² calls attention to the fact that fatal issues may be very perplexing and misunderstood, if the diabetes is intermittent and happens to be absent at the time of the fatal intercurrent disease.

In McBride's paper³ "on the significance of small quantities of sugar in the urine," he states that sugar has been found in connection with phthisis, pleurisy, cardiac disease, cerebral hemorrhage, certain psychoses and follows shock. If sweets are taken freely, especially upon an empty stomach, glycosuria is very apt to be produced. Hence, when an individual who did not present the ordinary symptoms of diabetes consulted him and he found sugar but not a high specific gravity, he expected, as a rule, a quick recovery under proper diet.

Blot⁴ in 1856 first drew attention to the presence of sugar in small quantities in the urine of puerperal women, and says that it is a physiological occurrence. He also states that the quantity of sugar is in direct relation to the activity of the mammary glands.

*Read at the Eighteenth Annual Meeting of the American Association of Obstetricians and Gynecologists, at New York, September 19-21, 1905.

Kiester⁴ in 1857 confirms as to the presence of sugar, but affirms that if the lacteal secretions be hindered, the sugar increases instead of diminishes, whilst in those women who have much milk, and whose baby thrives, only traces of sugar are found in the urine.

Brücke⁴ in 1858 says that sugar in the urine is physiological in nursing women, and in healthy individuals.

Ivanhoff⁴ says that the glycosuria of pregnant and puerperal women is not constant, as Blot states, but nevertheless it is often met with.

De Sinety⁴ in 1873 investigating the subject at length stated, that at the third or fourth day after delivery, he always found sugar in the urine.

Spiegelberg⁴ mentions that the urine is frequently saccharine, that the sugar is in the form of lactose and as a rule contemporaneous with the establishment of lactation, the quantity being generally in proportion to the quantity of milk. He regards the condition as one of resorption diabetes.

Hempel,⁴ 1874-1875, from an analysis of twelve cases concluded that sugar was present at some period during the puerperium, the greatest quantity noted being 1.6 per cent., and in this cases the breasts were enormously distended.

Kaltenbach,⁴ while corroborating the works of previous writers, at the same time noted the relation of sugar in the urine to changes in the mammary glands.

Hofmeister⁴ in 1878 showed that the sugar found in the urine of suckling women possessed all of the characters of milk sugar.

W. W. Jaggard⁵ is authority for the statement that Tarnier rejected the notion of physiological resorption of sugar, and ascribes the glycosuria of pregnancy to hepatic changes.

From the above opinions as given by various investigators, it is essential that in grouping our cases we draw a distinct line between sugar in the urine due to lactose and a diabetic urine.

The appearance of sugar in the urine of pregnant women, only discovered in cases where a systematic examination of the urine is made before and after parturition, is of little importance if the patient is otherwise symptomless. Yet even if it is classified as a physiological fact and of little importance, it puts the competent observer on his guard, and any pregnant woman with sugar in her urine needs careful watching.

When, however, large quantities of urine are being passed,

heavily loaded with sugar, and other symptoms of diabetes are present, an entirely different case is before us for study, and we have what Duncan considered a grave condition.

Partridge⁶ defines puerperal diabetes as diabetes developing during pregnancy, lasting through a considerable part or the whole of gestation, and disappearing to recur in succeeding pregnancies.

McCann and Turner⁴ in their investigation of a series of 100 cases, found that lactose was present in every case, but the quantity naturally varies at different periods and in different individuals. Regarding the date of appearance of lactose, in 29 per cent. of cases, the sugar was present on the day of labor. The question as to whether mental anxiety at this time would cause a temporary glycosuria, is as yet unanswered.

The late appearance of sugar in the urine in some cases, even on the fourth or fifth day, may be explained by lactation being delayed.

The theory now accepted is that, the mammary glands being in a state of great activity on the third and fourth day of the puerperium, milk rapidly forms, the breasts become distended, milk sugar is absorbed into the blood owing to the excessive production or diminished outflow of milk, and this access of milk-sugar is excreted in the urine, and thus is formed the largest amount on the fourth or fifth day. The more distended the breasts, the lesser the outflow of milk, and hence a greater amount of sugar appears in the urine than if there was no impediment to its flow.

In summing up their results McCann and Turner⁴ came to the following conclusions:

1. That the sugar present in the urine of women during lactation is milk sugar. Glucose may also be found.
2. That in the majority of cases, the largest amount occurs on the fourth or fifth day of the puerperium.
3. That sugar is present at some period in every case.
4. That the quantity depends on: (1) The condition of the breasts. (2) The quantity and quality of the milk. (3) The suckling of the child. Out of 100 cases, the average quantity found was .35 per cent., that is $1\frac{1}{2}$ grains per ounce.
5. That when lactation is diminished or suppressed, the amount of sugar diminishes or disappears.
6. That when the production and exhaustion of the milk are equal, the amount of sugar is very small.

Willson⁷ made a series of nearly 1,800 urinalyses in two years.

and the majority of specimens examined were from pregnant women. Of this number only a small percentage—22 per cent.—were entirely free from albumin and sugar, while in no case in which glucose was noted was albumin absent. When glucose appeared in the urine of a subject known to have previously not shown glycosuria, the occurrence, as a rule, took place at some time between the beginning and the end of the last month of pregnancy. Occasionally there was a trace of glucose throughout the pregnancy, this often disappearing completely after the birth of the child.

Payer⁸ has shown that women are less tolerant of sugar during pregnancy than at other times, as he and McBride produced alimentary glycosuria in 80 per cent. of his patients by increasing the amount of sugar ingested.

While sugar in the urine is looked upon as a physiological factor, if diabetes supervenes, all agree that the case becomes serious, that it is dangerous to the woman and perplexing to the attending physician.

Symptoms which generally attract our attention to diabetes are three—thirst, polyuria and pruritus vulvæ. Such were the symptoms in the case I wish to report:

Mrs. G., age 35, 5 feet 7 inches in height, weight 150 pounds, strong and healthy in appearance, but excessively nervous. Mother of one child, a girl, now six years old and no trouble at the time of the birth. Became pregnant the second time in 1902, and consulted me, not because she was pregnant, but for the intense itching over the whole vulva. She was not able to sleep over an hour at a time, and was so nervous that she was constantly bordering upon hysteria. History of pregnancy for three months. Complained of frequent urination and the passage of a large amount each time. Drank water freely, as the thirst was intense.

The urine contained a considerable amount of sugar. There was no history of diabetes in the family. I attended her two sisters at the time of the birth of their children and no sugar was ever found in their urine. At the fourth month a miscarriage resulted, all distressing symptoms soon began to disappear and after one month no sugar was found in the urine and in another month she appeared perfectly well. In 1904, Mrs. G. became pregnant for the third time. About the third month the itching began, sugar appeared in the urine, and I expected she would miscarry again, but this time she carried the child to full term. The husband was somewhat

alarmed at the large amount of water she was passing, saying that his wife would frequently fill a chamber at night. The itching became intense, sedatives were constantly applied, but gave only temporary relief. Appetite somewhat abnormal. Numerous little boils were constantly forming on her back, shoulders and face. Diet-sugar and starches prohibited as far as possible. The question of bringing on premature labor was thought of, but not discussed with the patient or her husband. At last the day of labor arrived, and with the exception of the complicating rawness and edema of the vulva and vagina, the labor was normal in all respects. She made a rapid recovery and at the present time there is no trace of sugar in the urine. The baby has thrived and nursed the breast for nine months. Such is the concise history of a case of diabetes coming on with and terminating soon after labor.

I have collected the following cases from literature, and short histories are given of each.

1. Bennewitz's Case⁹—A young woman in three successive pregnancies, the fourth, fifth and sixth, was affected with diabetes, which each time completely ceased on delivery, but again returned when she became pregnant. The fifth child was born premature and born dead, weight 12 pounds. Menstruation occurred during the fifth pregnancy.

2. Mathews Duncan's Case¹⁰—Suspicion of temporary diabetes at the end of a former pregnancy. Death of fetus before the labor, Diabetes about the end of 8th month. Labor beginning at ninth month followed by collapse. An excess of liquor amnii complicated. Patient had very peculiar breathing and died on the third day after delivery. This was the fifth pregnancy. She had had two healthy children and two early miscarriages.

3. W. L. Reid's Case¹⁰—In the first pregnancy a macerated child. Diabetes early in the second pregnancy. Death of fetus in the sixth month. Premature labor a few days later. Excess of liquor amnii. Patient survived, but with persistent diabetes. Dr. Pavy who saw the case, expressed his opinion that the diabetes had to do with the birth of the two dead fetuses.

4. Newman's Case¹⁰—First pregnancy and confinement normal. Diabetes persisted during the two succeeding pregnancies and till death. Second pregnancy and confinement natural. Third pregnancy, child born dead at sixth or seventh month. Death of mother on the third day after labor.

5. Newman's Case¹⁰—Diabetes in two pregnancies. Children born alive. Death of mother, two years after the birth of the last child, died after three days of coma.

6. Lecorche's Case¹⁰—Diabetes after a successful pregnancy and delivery. Had one child six years ago and a very interesting feature was that the infant became diabetic. Her mother, a gouty woman, died albuminuric. Diabetes persisted during subsequent pregnancy and parturition.

7. John Williams's Case¹⁰—Mother and two sisters diabetic. Elder sister diabetic after confinement and recovered. Patient's first child born alive at term, diabetes found the next day. Second child born alive at term. Excess of liquor amnii and no sugar in it. Diabetes persists.

8. John Williams's Case¹⁰—Sixth child died during pregnancy. Born at the eighth month. Diabetes from early pregnancy. Death sudden, four months after delivery.

9. Aubrey Husband's Case¹⁰—Diabetes in the third pregnancy. Child born feeble, died in a few hours. Death of mother eight months after from diabetes. Liquor amnii was found to contain sugar.

10. Mathews Duncan's Case¹⁰—Diabetes began at quickening in the eleventh pregnancy. Child large and born dead. Diabetes disappeared. Relapse. Death eight months after delivery, comatose.

11. Davidson's Case¹⁰—Diabetes in the middle of fourth pregnancy. Father diabetic. Child alive, feeble, one month premature, lived 13 hours. Temporary disappearance of diabetes after labor, but it reappeared and four months afterwards the patient died from diabetes.

12. Mathews Duncan's Case¹⁰—Sister died of diabetes. First pregnancy—boils, child died at eighth month, born at term. Second pregnancy—child born at term but decomposed. Third pregnancy—diabetes discovered at fifth month. Premature labor induced, child decomposed. Death the second day after delivery.

13. Frerich's Case¹⁰—Ninth pregnancy. Diabetes in eighth month. Death fifteen months later of phthisis and gangrene of the lungs. Tumor was also found in the medulla oblongata.

14. Seegan's Case¹⁰—Three pregnancies. Diabetes present. All ended in miscarriages about the middle of pregnancy and death followed the third miscarriage.

15. F. A. Packard's Case¹¹—Patient had four normal pregnancies and then three miscarriages.

16. H. D. Fry's Case¹²—Patient had one normal pregnancy. Second pregnancy resulted in death of child, and mother died of exhaustion on the fifth day.

17. E. L. Partridge's Case⁶—Patient in the first pregnancy. Child born alive and mother's condition good.

18. G. Herman's Case¹³—Patient suffered from boils, burning pain on passing water and a terrible itching. Patient delivered of a dead decomposing child, and she died nineteen days afterwards.

19. Kleinwachter's Case¹⁴—Patient had four normal pregnancies and two miscarriages. Condition of last child normal. The diabetes persisted in patient.

20. Stengel's Case¹⁴—Was referred to him by Hirst for suggestions as to dietetic and medicinal treatment. Patient's general physical condition improved under treatment, and the pruritus vulvæ speedily subsided. Labor—condition of mother and child good.

21. Whittridge Williams's Case⁶—Presented marked glycosuria, but went on to full term. The glycosuria disappeared after labor.

22. Winckel's Case¹⁰—Diabetes observed in second confinement. Child born alive.

Frequency.—Diabetes is far more common in men than in women. Duncan when he wrote upon this subject 23 years ago said, that the rarity is attested not only by its having no historical place in literature, but by the actual experience of accoucheurs and hospitals. That it seldom occurs in women during pregnancy, and among his own 386 observations of diabetes, 282 were in the male sex and 104 in the female. Of these 104 of the female sex only one was ill during pregnancy and in the eighth month. The age that diabetes affects women as a rule is late in life, and Kleinwächer's statistics show the commonest age to be between 40 and 50 years. Duncan says that cases come on during pregnancy, after delivery and during the suckling period, but are not sufficiently detailed to justify any deductions from them. They merely establish a possibility of the supervention of diabetes in these states. Of diabetes in pregnancy and parturition our knowledge is scanty in the extreme and Senator notes it is a matter for wonder even that pregnancy has been known to occur in diabetic women.

Results.—A woman who is diabetic rarely becomes pregnant, but if she does she is generally so debilitated that she will not carry the child to full term. Diabetes occurring in women of the

child-bearing age, results in a suppression of menstruation, and even atrophy of the uterus has been known to follow. Such being the case, it is rather fortunate, that only a small number of women become pregnant, as diabetes itself is such a serious disease to handle when uncomplicated.

Duncan's tabulated cases show the following results:

1. That diabetes may come on during pregnancy.
2. Diabetes may occur only during pregnancy, being absent at other times.
3. Diabetes may cease with the termination of pregnancy.
4. Diabetes may come on soon after parturition.
5. Diabetes may not return in a pregnancy occurring after its cure.
6. Pregnancy may occur during diabetes.
7. Pregnancy and parturition may be unaffected in its healthy progress by diabetes.
8. Pregnancy is very liable to be interrupted in its course and probably always by death of fetus.

In grouping the 22 cases that I collected and the one reported by myself, making in all 23 cases, I find the following interesting facts:

Out of this number there were 12 recoveries and 11 deaths, giving a maternal mortality of 48 per cent. This includes all cases that died as the result of persisting diabetes. The fetal mortality is very high. I am not able to give the exact percentage as many of the cases reported are not complete, and for the same reason I cannot state the number of miscarriages that occurred.

There were 19 multiparæ and 4 primiparæ.

Of the 4 primiparæ, one died and three recovered.

Of the 19 multiparæ, ten died and nine recovered.

In one case reported, menstruation persisted throughout the pregnancy.

In two cases, there was an excess of liquor amnii and one woman died, the other recovered.

In one case sugar was found in the liquor amnii, this woman dying eight months after the birth of child, of diabetes.

In one case sugar was found in the urine of the infant. The mother of this child lived and so did the infant.

As these cases are so uncommon no methods of surgical treat-

ment are advised, other than the bringing on of premature labor, if the case in our judgment justifies such a procedure.

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19 WEST SEVENTH STREET.

MYOMECTOMY.*

BY

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THE purpose of this paper is to call renewed attention to an operation too rarely undertaken.

Since the time when McDowell first pointed the way, and Semmelweiss made it possible, a great host of women, relieved of their infirmities, have been restored to health and happiness, and have found life worth the living. But the shadow of evil has followed this good, and many to whom benefaction was perhaps intended have remained maimed and crippled, derelicts upon the sea of life, with consolation offered only by the grave. The successful results following hysterectomy for fibroids has led to a wholesale onslaught in all cases of this condition, and a ruthless sacrifice of the uterus and its appendages is constantly taking place.

As experience and a knowledge of intraabdominal conditions increases, the desirability of more conservative measures is

*Read at the Eighteenth Annual Meeting of the American Association of Obstetricians and Gynecologists, at New York, September 19-21, 1905.

impressed upon the surgeon, and the saving rather than the destruction of organs and parts becomes his constant effort and rule of practice. The trend of surgery is ever toward conservatism, and unnecessary and unwarrantable procedures should evoke the strongest condemnation from every one who has the good of his craft at heart.

In 1874, Spiegelberg¹ demonstrated the possibility of enucleating fibroid tumors from the uterine wall with closure of the wound by suture. He was later followed by Billroth, Pean and others, notably by A. Martin, of Berlin,² who showed that myomectomy could be accomplished without increasing the dangers of operation to the patient, while it possessed advantages over hysterectomy in conserving the uterus, putting its tissues in the way of renewed health, restoring functional activity to the organ, and rendering subsequent pregnancy possible.

But the failures which followed the earlier operations of this nature unjustly prejudiced many against its performance, a bias which still obtains among a certain few. A careful scrutiny of reported cases will, however, show that, in many instances, the objections to the operation are ill founded, poorly selected cases, faulty technique or failure in some detail of asepsis being responsible for the unfavorable results.

To determine the worth of any operation it is necessary not only to be thoroughly familiar with its technique, but to compare the immediate and end-results with those which are known to be obtained from other operations of a cognate nature, or which are directed to the relief of the same condition. Enlarged experience has proved that myomectomy, under proper restrictions, has accomplished all that is effected by hysterectomy, but without the loss of organ or function or the precipitation of those nervous and mental phenomena which not infrequently render life a living death. In considering the conservative operation for uterine fibroids, many of the factors making for success or failure are often left untouched; generally only the technique of the operation is discussed. As a result, the student of methods is uninstructed as to the conditions governing the proper application of the procedure.

Whether myomectomy is preferable to hysterectomy in a given case depends largely on the age and physical condition of the patient, the involvement of the uterus, and the size and distribution of the tumors.

Other conditions being favorable, no woman during the child-bearing age should be deprived of her uterus, provided sufficient muscular tissue remains after enucleation of the tumors to insure restoration of the organ to its nulliparous size. The ability to decide this question, in many instances, can be a matter only of experience and technical training, but it is safe to say that the more skillful the operator the less frequently will he find it necessary to resort to total ablation. My own statistics show about thirty-two per cent. of myomectomies. These were undertaken either as the principal or as a supplementary operation.

For obvious reasons women suffering from grave somatic or thoracic disease, or other abdominal disorder, are unfit subjects for myomectomy. In this connection too much stress cannot be laid upon the importance of recognizing the effects of hemorrhage on the general economy. The changes in the blood, heart, liver, kidneys and other abdominal viscera induced by prolonged menorrhagia³ may render any operative intervention of extreme seriousness—in the instance of myomectomy more surely fatal from the continuance of blood-loss, which may be expected in many cases during the reestablishment of normal menstruation. Pelvic inflammation, especially if associated with pus formation, is also a strong contraindication for the operation. When the ovaries or tubes of both sides are damaged beyond repair, hysterectomy should always be done, but the presence of a unilateral ovarian cyst, a small pus tube when the appendages of the opposite side are in a healthy condition, or when the partly diseased tubes and ovaries permit of resection, the complication does not militate against a successful outcome from enucleation. A case of the last description illustrates the possibilities of conservative work.

A young woman, aged 31, married five years, sterile but very desirous of children, consulted me regarding fibroids of the uterus, from which she was suffering. The condition had been discovered two years before, and she had since been subjected to various treatments, including electricity, but with little or no relief. From the beginning menorrhagia had been an increasing symptom, and of late there had been several slight intermenstrual discharges of blood. The uterus was found to be enlarged to about the size of a four-months' pregnancy and was irregular in outline from a number of fibroids projecting

from its surface. It was freely movable. The cavity ran forward and measured $4\frac{1}{2}$ inches.

As she was anxious that something radical should be accomplished for the relief of her condition, operation was undertaken with the distinct understanding that whatever was demanded should be done, but that if possible the organs would be spared.

At the operation the uterine canal was first thoroughly dilated and curetted. The abdomen was then opened and seventeen fibroids varying in size from a small orange to a white bean and for the most part interstitial, were removed by enucleation. The beds of the larger tumors were united by deep sutures of catgut and the peritoneum over each incision was closed by the same material. The distal third of each Fallopian tube was covered by fine adhesions, dilated, the end clubbed and the abdominal opening closed. This part of the tube was resected and the remaining portion of each side attached to its respective ovary. The right ovary was of normal size and apparently healthy. The left ovary, which was buried in adhesions, was enucleated and its outer half found to be occupied by a hematoma the size of a large cherry. This was cut away and the wound in the ovary closed by catgut.

The patient made a good recovery and regular menstruation was resumed at the proper time. A recent report states that she is in "glorious health."

Regarding the involvement of the uterus myomectomy is, of course, not to be considered in those cases in which the growth occupies the whole or major portion of the organ, or where from the size of the tumor the incorporated uterine canal has become greatly elongated. Exceptions to the latter may be found in pedunculated fibroids, either subserous or submucous, in which the uterine cavity is often excessively distended or stretched out. It may be said that in general interstitial fibroids of a size exceeding a child's head do not offer favorable indications for the operation. On the other hand, myomectomy is well suited to single, small and medium size tumors situated in any portion of the uterus, and in multiple isolated growths which are separated by a fair amount of muscular tissue.

As to the number of such tumors which may be extirpated with safety, there is a difference of opinion. In my own experience the physical condition of the patient and the amount of involved muscular tissue present in the uterus are the determining factors. These being favorable, almost any number

of fibroids may be enucleated. In the case of an unmarried woman 34 years of age I removed by abdominal section thirty such growths from different portions of the uterus, the patient making a rapid recovery and remaining well since.

The effect of the removal of the tumors on the uterine musculature is not as yet quite plain. Laboratory investigation shows that regeneration of smooth muscular tissue after injury may take place to a limited extent, but that healing results largely through the formation of fibrous tissue.⁴ Clinically it would appear that either the amount of fibrous tissue deposited after myomectomy must be small or that some subsequent change takes place whereby it is largely removed, for its presence does not appear to interfere in any way with the functions of the organ.

Following myomectomy the re-establishment of menstruation, especially if a number of tumors have been removed, is usually associated with increased blood loss, sometimes amounting to hemorrhage. The flow, however, gradually becomes less with each succeeding month, until the normal is attained. During this rehabilitation period the patient should be kept in bed during the menstrual week, and such remedies given as tend to check the local discharge.

One of the most pertinent objections urged against myomectomy is the possibility of the development of new growths which have been overlooked and left behind at the primary operation. This occurred in one of my own cases in which I removed a large pedunculated fibroid together with a submucous tumor the size of a pullet's egg by the vaginal route. The subsequent appearance of other tumors rendered a pan-hysterectomy necessary four years later. By the abdominal route the overlooking of isolated tumors is less likely to occur, for, as the fibroids are enucleated by pinching the tissues between the fingers, any growth the size of a pin's head can be readily detected. But, granting that subsequent development may occasionally occur, is the conservative operation not worth while, since the woman remains in possession of her pelvic organs perhaps for years, and possibly until near or after the establishment of the menopause, when total ablation of the affected parts becomes a matter of less somatic and psychic importance?

According to the statistics of G. Winter⁵ pregnancy following myomectomy is more likely to take place in women under forty

years of age, while the size and situation of the tumor plays an important rôle not only as regards conception but also in the matter of carrying the products to term. Following the extirpation of fibroids larger than a child's head, pregnancy is a rare event.

Of Winter's collected cases, in the submucous variety of fibroids 22 per cent. conceived; in the pedunculated subserous 20 per cent.; and in the subserous-interstitial 20 per cent. From the fact that abortion is more likely to take place after the vaginal extirpation of fibroids, on account of the extensive injury to the uterine lining, the abdominal route is to be preferred for their removal. In none of Winter's cases was the working capacity of the uterus interfered with—a sufficient answer to the objection of Döderlein and Krönig, founded on a single experience,⁶ that rupture of the organ may occur during labor from the sudden giving away of the weakened wall. Surely no one would think of giving up the Cesarean operation because this accident has occasionally occurred from a similar cause.

In regard to the technique of myomectomy little need be said. As already stated, abdominal section offers the best and safest way of getting at the tumors and of controlling hemorrhage and preventing sepsis. Drainage following operation is, in my experience, of the greatest importance. To this end thorough dilatation of the cervix and uterine canal should always precede the attack from above, and unless the operator can be positively assured that oozing from the cut surfaces will not take place, a drain reaching to the bottom of the pelvis should be placed in the lower angle of the parietal wound. The advice of Leopold to remove as many tumors as possible through a single uterine incision is always to be borne in mind. The edges of large beds in which the tumors have rested should be trimmed and their sides brought in close apposition by deep and superficial sutures, preferably of catgut, and the peritoneal incision carefully united by sutures of the same material.

In closing I submit as the argument of this paper:

(a) The ruthless sacrifice of the uterus in many cases of single and multiple fibroids of that organ is greatly to be deprecated, and the influence of good surgery should be toward the discontinuance of such unnecessary measures.

(b) Myomectomy affords relief in a large percentage of these cases and has the advantage over hysterectomy in conserving

the uterus, putting its tissues in the way of renewed health, and restoring functional activity.

(c) Under modern methods, in skilful hands, the dangers from this operation—hemorrhage and sepsis—so greatly feared by the older operators, have been practically removed, and in suitable cases almost any number of tumors wherever situated may be enucleated with satisfactory results.

(d) In determining on myomectomy as the operation of choice, the age and physical condition of the patient, the arrangement and distribution of the tumors, and the amount of uterine musculature present must be given chief consideration.

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- 32 ADAMS AVENUE, WEST.

ASEPTIC MIDWIFERY.*

BY

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ALL through the ages there has been a trail of danger to, and death for, the puerperal woman, from what, in times past, has been called puerperal fever, puerperal septicemia, and various other names, but is now better known as puerperal infection. While the same kindly Providence that has watched over fools, drunken men and children, has also watched over women in child-bed, it behooves us not to rely too much on that kind and beneficent aid to save patients from an untimely death, and to use every precaution of cleanliness, whenever we are called to attend a case of labor. We labor under almost insurmountable difficulties when we endeavor to carry out full aseptic and anti-

*Read before the Union County Medical Society, Elizabeth, N. J. July 12, 1905.

septic precautions in every case of child birth, and there are cases in which it is impossible for us to do more than be clean ourselves. We can, however, under the most unfavorable circumstances, render patients a great service by insisting that for once in their lives they must be clean in person and surroundings; and if we can eliminate the old nurse who insists that she knows as much about "fetching babies" as the doctor we will have made a long stride toward better conditions for the lying-in woman.

We will consider, first, the means that should be used in hospital practice, and, second, what should be done in private cases.

Every well appointed hospital should have a separate pavilion for maternity cases, or if that is not possible, the puerperal patient should have a private room that has been thoroughly fumigated with formaldehyde gas, and the walls, woodwork and furniture washed with a 1-1000 bichloride solution after the previous occupant has been removed. After being fumigated and cleansed the mattress should be exposed to the fresh air and sunshine for two or three days, and all the bedding should be absolutely clean. If there is a maternity pavilion there should be rooms in which suspicious cases can be placed so that there will be no danger to the non-infected patients.

When a patient is admitted she should have a cleansing bath in which green, or some antiseptic, soap should be freely used, and not only the body, but the head, should be washed, the hair receiving especial attention. After the bath the patient should be dressed in clothing that has been thoroughly washed and is absolutely clean. The bowels should be regulated, and a liberal diet given until labor comes on. As soon as the first signs of labor appear, an enema of soap and water should be given and the bowels thoroughly moved. After the bowels and bladder have been emptied, the body from the waist to the knees should be washed with soap and water followed by a 1-1000 solution of bichloride of mercury. The abdomen, vulva, and inner side of the thighs should receive especial attention. If the vulvar hair is very long it should be clipped with the scissors, or, better shaved if there has been any suspicious discharge from the vagina. Unless there is some very good reason for giving it, the vaginal douche should be omitted. The abdomen and thighs should be covered with sheets or towels, and the vulva with a sterile pad. The nurse and doctor should take the same precau-

tions for a case of labor as for an abdominal section, including the use of sterile caps, gowns, and rubber gloves.

During labor, as few vaginal examinations should be made as possible, the diagnosis of presentation and position being made by external examination and confirmed by the first vaginal examination. When it is necessary to make an internal examination, the labia should be separated by the fingers of the free hand, and the examining fingers should not come in contact with anything until they enter the vagina. Unless some complication requires it, the hand should never enter the uterus.

After the child is delivered, and the cord cut, the placenta should be delivered by the Credé method, or by a combination of pressure and traction, with a twisting of the membranes into a rope as they are delivered. Unless it is absolutely necessary to do so, the fingers or hand should never enter the vagina after the third stage of labor is completed, for whereas, prior to this time we have been working in a sac that is to come away and bring with it blood clots and other débris, we now have numerous abrasions, if not absolute tears, in the vagina and perineum, with the open mouths of the uterine sinuses and lymphatics ready to take up infectious material and carry it into the general circulation.

After a thorough cleansing of the external parts they should be inspected for lacerations, and if any are found they should be repaired at once with silk or silkworm gut sutures, under the same aseptic precautions that have been observed in the previous conduct of the labor. Unless there has been operative interference a postpartum vaginal douche should not be given; but if the labor has required any assistance, either manual or instrumental, a vaginal douche of creolin—one drachm to the quart of sterile water—should be given, but not repeated unless it is clearly indicated by well-marked symptoms.

The nurse who has charge of the patients in a maternity pavilion should not, under any circumstances, handle or care for any other patient, and if infection should occur a special nurse must be provided for that case, and this nurse must not come into contact with any of the other maternity patients. The obstetrician will change all his clothing, and carefully disinfect his hair and beard, as well as his hands, before attending maternity cases, either in hospital or private practice, if he has any case of contagious or infectious disease under his care.

It is possible to obtain practical asepsis in nearly every case of labor in private as in hospital practice. When the mother-that-is-to-be engages us for her labor and we have made the usual inquiries, including examination of the urine, and a personal examination, we should give her instructions as to the preparation of her bed and clothing for the expected event. We should tell her to have sheets and towels well boiled, then well ironed with very hot irons, and enclosed in a sheet or other covering that has been prepared in the same way. This will give sterile coverings for the bed and sterile towels. The patient and her nurse should be instructed that as soon as labor begins a soapsuds enema is to be given and the bowels well cleaned out. When we arrive and find the patient in labor, we should order the nurse to scrub the vulva, abdomen and thighs with antiseptic soap, and then wash them with a 1-000 bichloride solution. If we have not complete confidence in the nurse's ability to do this well, we should give it personal supervision, or do it ourselves. After the parts have been prepared, they should be covered with sterile towels, or, better, with a perineal sheet and long stockings. The same remarks that have been made in regard to vaginal examinations, douches, etc., in hospital practice, will apply with equal force to private obstetric work. We should always carry in our obstetric satchel a sterile gown and rubber gloves. While few have a nurse to attend to these things we can sterilize rubber gloves in a very few minutes. After thoroughly washing them with soap and water, rinsing them in plain water, and then boiling them for ten minutes, dusting them with some sterile powder and wrapping them in a sterile towel or other container, they are ready for use when needed. If the forceps is required, I know of no better sterilizer than the family washboiler, in which all the required instruments can be boiled, and, at the same time, a good supply of sterile water is prepared.

The delivery of the placenta, the search for, and the repair of lacerations, etc., of which I have already spoken, should be as carefully carried out in private as in hospital practice. After all these things have received proper attention, the vulva should be covered with a sterile pad, and the nurse carefully and vigorously instructed that her hands must be clean before she touches the vulva or surrounding parts, and that these parts must be carefully washed with boiled water after every evacuation of the bowels or bladder. I think that it is better for the puerperal

patient to use the vessel or commode in preference to the bed-pan, as there is less likelihood of the discharges from the rectum or bladder coming in contact with the parts, and it also gives freer escape for the lochial discharge if the upright position is assumed for a few minutes three or four times a day.

I consider the administration of one-half drachm of fluid extract of ergot three times a day as one of the best aids in the prevention of puerperal infection, for by its action on the uterine muscular fibers it keeps the uterus well contracted and prevents the accumulation of clots in its cavity where they would form an ideal culture medium for pathogenic bacteria.

What I have said regarding the care of the patient at full term delivery applies with equal force to the treatment of premature delivery or abortion.

PHYSIOLOGY OF TEMPERATURE: WITH SPECIAL REFERENCE TO THAT OF THE PUERPERIUM.*

BY

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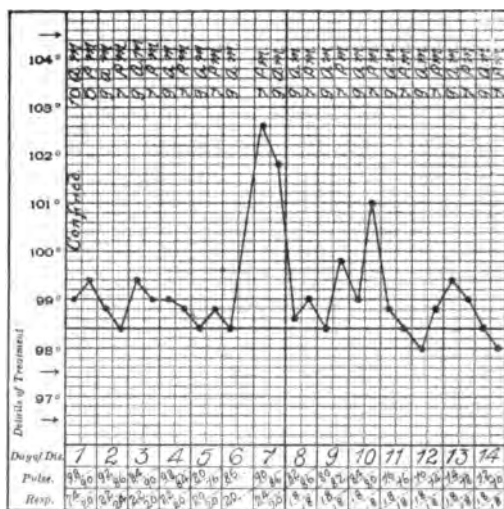
(With seven charts.)

My experience of the past few years and the record of the mortality of the Reineman Maternity Hospital, show that when comparing our results with those of many practitioners and the statistics given by other maternities, the mortality in the puerperal state could be materially reduced by careful observation of the exact conditions which are found as a result of normal physiological action.

I do not exaggerate when I say, that especially in private practice, and in the hands of those who still follow the teachings of the older writers in the treatment of the puerperal woman, and also in the management of labor itself, many a woman has unnecessarily died; the cause, in many cases being fear and over-anxiety on the part of the physician.

*Read before the Lawrence County Medical Society, New Castle, Pa., February 16, 1905; revised and read before the Allegheny County Medical Society, Pittsburg, Pa., May 16, 1905.

In order that we may best discuss the conditions of the woman after labor has terminated, with particular reference to that of the temperature, it is well to consider the physiologic conditions which have to deal with the heat of the body. The heat, as produced in conjunction with the energy, arises chiefly from the processes of metabolism. This is slightly affected by such conditions as age, exercise, climate, food, and to a greater extent by the time of the day; while such conditions as emotions, etc., seen best in hysteria, will frequently cause a non-pathological rise of temperature of several degrees.

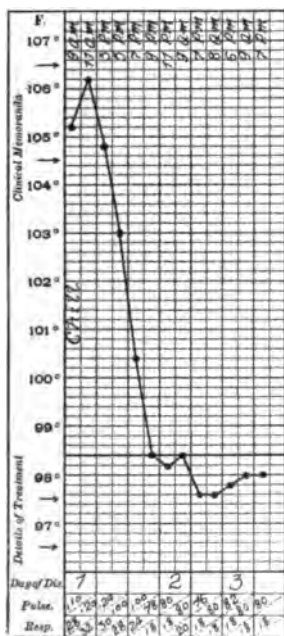


Miss F. W. Confinement.—Constipation, Sixth Day.

Man, a warm-blooded animal, has certain prominent heat regulators. His temperature varies but little, whether he be in the torrid zone or in the icy fields of Greenland. On the other hand, cold-blooded animals have a temperature which is variable with the atmosphere in which they live. For example, the frog may in the summer months have a temperature almost equal to that of his more highly developed brother, but in the winter, if subjected to extreme cold, ice may be found in his body, the fluids of the same having been frozen; and yet the animal when restored to a warmer temperature changes from an apparently lifeless to an active living animal.

In the metabolism of the food products and of the body tissues

we find that almost all of the heat and energy is derived from the breaking down, or as it is generally called, katabolic processes, while the synthetic processes furnish but a small amount of heat. The maintenance of the temperature in man depends upon the chemical changes continually taking place. The oxygen taken in chiefly through the respiratory tract unites with the hydrogen and the carbon, and oxidation of these products takes place. In man we find that in order that there may be a compensation for the amount of heat produced, compared with that given off, there is



Mrs. H. Dilatation of Urethra.

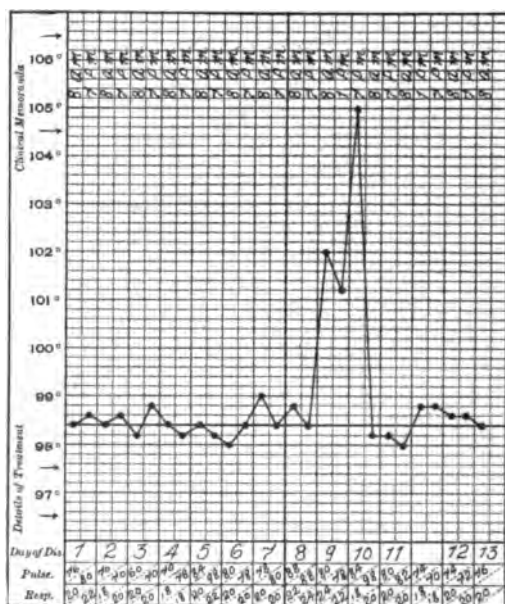
an arrangement whereby connection is made between the peripheral and central parts of the nervous system which so regulates the normal condition, income and expenditure of heat of the body, that the daily variation in health under all conditions is rarely over two degrees and usually much less.

This arrangement by the nervous system is connected peripherally to the blood vessels on the one hand, and to such structures as the skin, glands, mucous membranes, etc., peripherally on the other; while centrally, through which impulses must pass which

regulate the changes in the blood supply to the part, we find the higher centers as the important factors, the chief of which are presumed to be located in the cerebrum.

The expenditure of the heat is principally due to the loss through the skin by radiation, evaporation and conduction. In the production of heat we find that the fats entirely, the carbohydrates almost entirely, and to a much less degree the proteids will form as much heat when burned in the body as when combustion takes place outside of the body itself.

We refer here to the catabolism of the respective classes of tissues, not to the breaking up of the foods themselves. The prin-

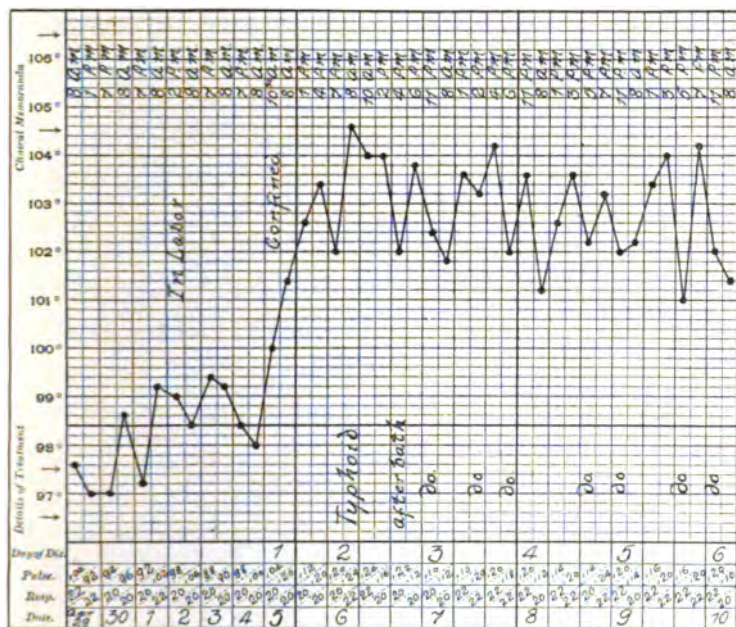


Mrs. M. Nervous.

cipal product of proteid metabolism, urea, is still capable of suffering further combustion after it has left the body.

At the present day, the practitioner acting for his lay brother, is compelled to seek not so much the treatment of disease as its prevention. It is necessary that he know the amount of heat which can be produced by certain forms of diet, and the amount of each class of food that should be taken daily. The value, as set upon the different foods is based chiefly upon the amount of heat which these will respectively produce; and, as given for the number of

kilo calories required by an individual taking moderate exercise for twenty-four hours, is about three thousand. The relative value of each, per gram, is: proteids, 4.1; carbohydrates, 4.1, and fats, 9.3 calories. The amount of exercise taken by an individual must necessarily require a variation in the number of calories demanded. In health, and also in disease, we see that to a great extent the maximum amount of heat is produced in the body in those parts where we see the greatest activity, where there is the greatest amount of katabolic change; that is, in the muscles. Following



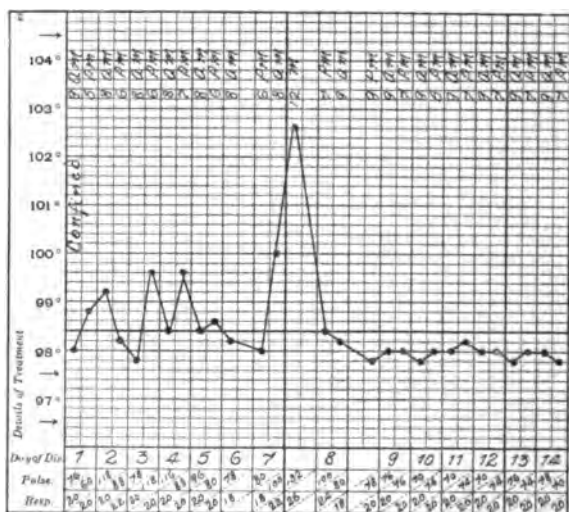
Mrs. K. Confinement.—Typhoid.

these we find the liver, alimentary canal, glands, brain, etc., in order.

While it is interesting to know the amount of heat produced within the body, also the amount which may be expended by the different avenues of escape, for our understanding of fever, or in many cases, as we shall call it, elevation of temperature, we must look carefully to the compensation or compensatory apparatus which maintains the equilibrium so nicely and constantly throughout life. Even in fever we find that the effort is still made to maintain this equilibrium.

It is now known that the metabolism of certain products of the body, for example, proteid metabolism, depends almost entirely upon the amount of proteid food eaten; in other words, the amount of urea which is excreted, formed from the breaking down and oxidation of the proteid tissues and products circulating in the body is directly proportional to the amount of proteid food taken into the body.

For years it has been believed that in many obstetrical conditions, as eclampsia, etc., the amount of urea was indicative of the condition of the patient. We know now that this normal constituent of the urine depends upon the amount of proteid food

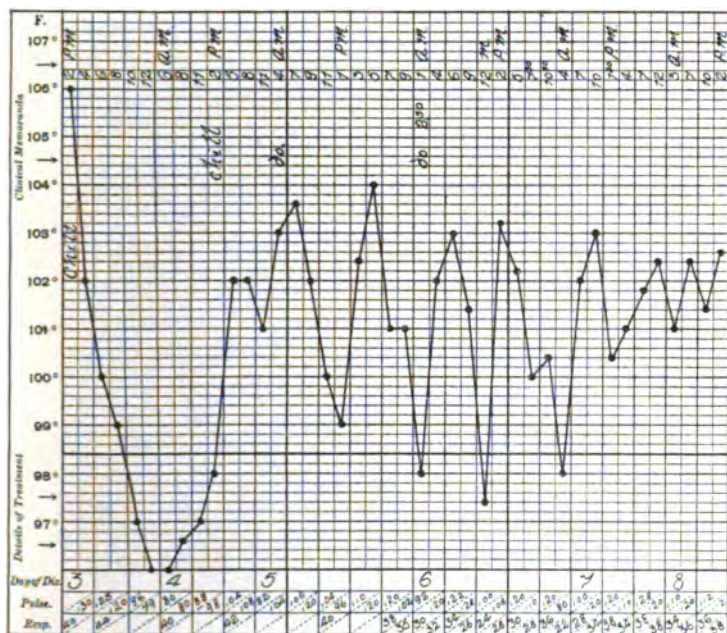


Mrs. R. Confinement.—Irritation of Breasts, Seventh Day.

taken by the person. This does not hold true with all proteid products, for it has lately been shown that the amount of creatinin excreted depends to a large extent upon the weight of the person regardless of the kind and quantity of food taken at the time. So rapid and so effective is the control of temperature by the nervous system that section or stimulation of certain nerves will cause a rapid rise or fall, as the case may be, of the temperature of the parts supplied. Stimulation of the corpus striatum, optic thalamus, septum lucidum, caudate nucleus and corpus callosum have been followed, in the hands of many experimenters, with a rise of temperature. Traumatic lesions of the brain and cord are

quite often followed by changes in the body temperature, entirely independent of the metabolism of the body at that time, the condition being, in these cases, a change in the equilibrium of the income and expenditure.

In the elevated temperature we find that both the amount of oxygen absorbed and of carbon dioxide eliminated are increased. There is an alteration of the respiratory quotient. Destruction of the nerve endings or section of the medulla oblongata will produce a condition in man which corresponds to that of cold-blooded



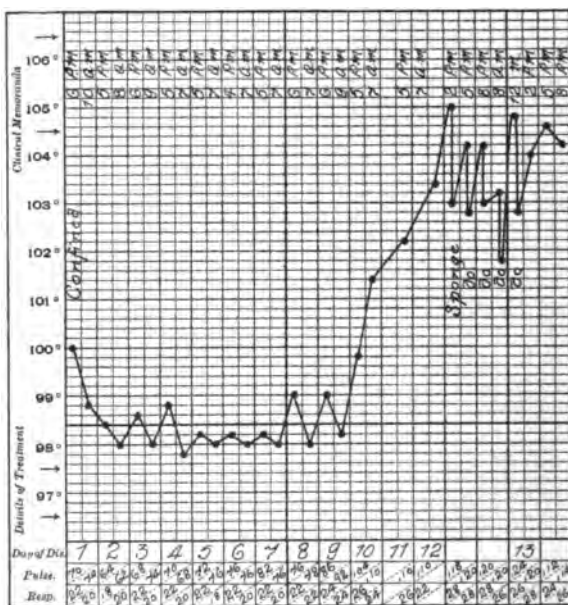
Mrs. G. Confinement.—Sepsis from Retained Placenta.

animals; that is, after such destruction heat may be added to, or taken from the body, showing that the arrangement for the normal maintenance of bodily temperature is not intact; it will soon be possible to demonstrate that in many conditions in man where an elevation of temperature may exist, there is partial and temporary inhibition of the regulating factors which corresponds closely to the results experimentally produced.

The normal connection is between the skin and the muscles, and it is probable that in these experiments and in the conditions which present themselves to us, the inhibition is at one of these places

mentioned; that is, there has been some interference in the normal reflex arcs, the regulating centers being much influenced by impulses from the skin; the efferent nerves may be either augmentative or inhibitory.

The effect of heat on the vital centers, as seen in common fevers, is to cause activity of the vital organs and great increase of metabolism in many parts. The temperature of the body will respond to a certain extent to excessive heat or cold. An approximate quantity of the heat produced by an organism may be made



Miss I. M. Confinement.—Smallpox Rise on Tenth Day.

by the amount of oxygen consumed, and it is well that we remember this fact, for in those conditions which we shall mention later where we find that there is not a true pathological condition present there is no evidence whatever of the amount of oxygen absorbed being increased. It is stated by one writer that one-seventh of the heat of the body is produced by the union of oxygen and hemoglobin, forming the chemical compound oxyhemoglobin.

After a profuse acute hemorrhage the temperature may fall from .5 to 2.° C., which may be due to the reduction of oxidation

processes in the tissues. Poisons, including chloroform, alcohol, etc., and such drugs as quinine,, probably furnish less molecular decomposition. In the anesthetics, this diminished molecular decomposition is probably in the nerve. Strychnine, by increased molecular activity, causes a rise in temperature, most marked in the convulsions of strychnine poisoning.

The body may suffer a range of temperature in disease from 22° to 44.65° C. Irritation of the peripheral nerves is normally due, as seen in the skin, to thermic stimulation. In the intestines and digestive glands it is mechanical or chemical, all being reflex in nature, and acting centrally on the regulating heat centers. These known physiological conditions explain the non-pathological elevation of temperature seen in the puerperium. If the provision be made that with increased heat production, heat dissipation shall also take place, there can be no elevation of temperature or accumulation of heat. According to the Leibermeister school, heat regulation is placed upon a higher level during the febrile process; increased heat production can be attributed only in the smallest part to the transformation of increased circulatory activity into heat, but in the largest part is dependent on the heat generated in the process of combustion. In many diseases this is quite apparent, for though the patient may consume but a small amount of food daily, and consequently the products of the same circulating in the body would be relatively reduced, yet the products of metabolism, as evidenced by the heat generated, by the constituents of the urine, and, lastly, by the emaciation of the patient herself, show active oxidation processes are taking place.

In some cases we find that subnormal temperature may be due to the excessive loss of heat; in others, the high elevation of temperature, such as may occur after catheterization or with the passage of a gallstone through the bile duct, is a temporary retention of heat, in both cases the amount produced being the results taking place through the reflex action of the vasomotor centers.

According to many, antipyretics act by restoring heat regulation to a lower level. Quinine acts in the reduction of temperature by limiting heat production. According to others, the antipyretics act principally in the increase of heat dissipation through the dilatation of the blood vessels, while heat production is but little affected.

Ziegler states that the characteristic sign of fever is an increased bodily temperature, but accompanying it there are other symptoms, especially an increase in the pulse rate, disturbance in the distribution of the blood, changes in the gaseous interchange within the

lungs, and also in the urinary secretion; there is usually, but not necessarily, a subjective feeling of illness. The cause of fever is not known with certainty, yet this much can be said, that fever is most frequently the result of the entrance of harmful agents into the fluids of the body. It is probable that the entrance of parasites and their multiplication within the body causes an increased tissue destruction, either directly or through the production of unformed ferments; and at the same time substances are produced which act as poisons upon the central nervous system. The action of the poisons may be assumed to be such that, on the one hand, activity of muscles and glands, and consequently heat producing metabolism is increased; while on the other hand, through the diminution and disturbed function of the nerves governing sweating, as well as those of the vasomotors, the heat dispersion falls behind the heat production. Further, though the organism makes an attempt to regulate the temperature, yet it is no longer able to maintain it at a normal level, because of the disturbance of the regulating apparatus.

What share in the increase in the body temperature is due to the direct action of bacteria and of ferments of the bile, and what share is due to the increase of metabolism through the stimulation of the nerves as well as the disturbance of heat dissipation, cannot at present be determined. Lazarus-Barlow states that heat may be developed in the breaking down of food products, as well as in oxidation. The amount of heat produced by the heart in twenty-four hours is equal to from one hundred to three hundred kilo calories. The direct action between the production and the loss of heat is by the blood.

It has been shown that water at a temperature of 98.4° F., when held in the mouth for two minutes, will cause a rise of temperature of $.5^{\circ}$ F. When the body is placed in a bath at 112° F. for twelve minutes, the temperature rises from 98.2° F. to 103.2° F., with faintness, palpitation, etc. The symptoms are those associated with great exercise, or the mechanisms, presiding over heat loss. They cannot justly be called pathologic.

Temperature may return to normal or below normal in about an hour. There has been both a diminution of heat loss and heat added from without in the above instance. Hyperthermia, or an elevation of temperature above normal, without the associated conditions which produce fever, is not pathological unless we should have the conditions existing for at least a number of hours, and being evidenced by changes in tissue oxidation. Hyperthermia may

become pathologic when we have increased heat production, diminished loss, and the actual addition of heat to the body. Such conditions as hysteria, urethral fever, teething, indigestion, constipation, and many peripheral irritations we find classed as fevers, or having associated fever as a symptom. In most of these, or at least many times, the elevation of temperature is the principal recognized sign of any disturbance and should be called hyperthermia.

It is most likely that in these cases, as is plainly evidenced in hysterical women, the heat regulating center is developed to a lower degree than in the more normal individuals. On the other hand, hypothermia or fall of temperature may be due simply to exposure to low temperature. It is a common condition in many diseases, as nephritis, pulmonary diseases, cardiac and nervous diseases, and starvation, and from the use of drugs. The drugs act either by dilatation of the vessels, lowering of metabolism, interference with the heat centers, or production of heat. True fever, or pyrexia, consists of increased temperature, altered metabolism, etc. The rapid changes produced by the temperature are seen distinctly in the exfoliation of the tongue, the altered glandular secretions, and the reaction of the blood; when viewed pathologically, by cloudy swelling, fatty degeneration, etc., of the vital organs.

In the fever of malaria, elevation of temperature is seen with the appearance of microorganisms in the blood, acting either mechanically, by the poisons formed by the plasmodium, or the direct changes to which they may give rise in the blood and tissues.

In diphtheria, the bacilli are absent, as a rule, from the blood; the conditions being produced by the products of the organisms themselves.

In health, antipyretics produce no effect. In malaria, quinine acts directly upon the microorganisms. Antipyrin alters the conditions of the blood vessels in the skin, increases the heat loss, and acts upon the cerebral centers which prevent the loss of heat.

It is entirely theoretical how the equilibrium is maintained. One school claims a thermotactic mechanism exists, which, in fevers is set high, but behaves as normal. Another school claims that the thermotactic center is set in health but behaves abnormally, and that the disturbance is due largely to a thermolytic center which behaves abnormally also. Others, yet, claim the existence of thermotactic, thermolytic, and thermogenetic centers. If the first of these is deranged, the temperature is irregular. If the latter

two are deranged, fever exists. If all three are deranged, there is an irregular rising temperature.

Having concluded the physiology and some of the general pathology of the conditions which may exist in the puerperium, let us now review the temperature as found in these conditions, endeavoring, if possible, to see to which class each may belong. During the pregnant condition, the temperature as found by us, and contrary to most who state there is no alteration of the temperature, is lowered about one-half of a degree in the daily level. At the time of labor the woman is presumed to be in a normal physiologic condition. I say normal physiologic condition, for we find that many of the structures of the body are changed to accommodate themselves to the welfare of the mother and child. Such conditions are changes in the circulatory, urinary, and other systems.

The puerperium extends from the end of the third stage of labor to the time the uterus returns to its normal dimensions, generally six weeks or more. During this time we find that, besides the large amount of foreign material which exists within the genital organs, the woman also has to absorb and otherwise dispose of a large amount of uterine tissue. At first glance it would appear that the increased products of tissue change, rapidly thrown upon the body in practically one location, would disturb the heat mechanism to such an extent that it would be particularly noticeable; but this we find is not the case. With the exception of the temperature immediately following the termination of labor, and which generally disappears not later than the end of twenty-four hours, we find a large percentage of cases in which there is not a variation extending beyond the normal range. With this peculiarity, that, while the variation is most frequently within the range of two degrees, yet instead of being from 97° to 99° , it will be from 98° to 100° . In 1420 cases, Edgar found that 97 per cent. had a temperature ranging from 97° to 100.4° , and in about one-fifth of these the temperature ranged from 99.5° to 100.4° . In the remaining 3 per cent. the temperature varied up to 103.4° . These observations were made within one hour after the termination of labor.

With my observations of 638 cases, it is impossible to state how many of these had elevation of temperature due to the period of labor, as many of the recorded temperatures are not definite as to the time elapsing before labor, but the charts at my disposal show a large percentage with an elevation of one or more degrees immediately following labor. During the successive days, Edgar states that in 18.5 per cent. of 2,200 cases, a temperature of 100.4° or

more was found. Apparently the statistics last given frequently do not incorporate the temperature immediately following labor, although it actually forms a part of the puerperium. In the 2,200 cases, he found 3.3 per cent. with a temperature exceeding 100.4° and lasting over three days. In my observations of 638 cases I found 36 cases with a temperature exceeding 100.4° for three days. Six were due to typhoid fever and one to smallpox, leaving 29, or 4.5 per cent. to other causes

Williams states that a higher temperature than 100.4° in labor probably indicates infection of liquor amnii; that there is no milk fever. Also, that if, while the patient is doing well, a chill takes place and is followed by a rise of temperature on the third or fourth day, it is a sure sign of infection, unless we can account for the temperature by some other satisfactory cause. He says that normal temperature should be afebrile; that every rise of temperature in the puerperal woman should be regarded as due to infection until it has been clearly demonstrated that some other exciting cause is responsible.

Lusk states that a temperature above 100.5° is by no means compatible with a satisfactory condition of the patient; the elevation may continue during the first six days, morning remissions and evening exacerbations following along the daily variation.

It is stated by some writers that, in fact it has been so firmly taught that it seems to be almost a fixed law that, if the normal limit of 100.4° is reached and maintained for over twenty-four hours, some infection has taken place. Statistics of temperature above 100.4° vary from 9 to 54 per cent. As stated in the beginning, and as shown conclusively by a study of reliable statistics, we find that the largest percentage of temperatures exceeding 100.4° , many of which last over twenty-four hours, is not due to infection, or, if so, it is due only to those saprophytes which normally inhabit the female internal generative organs.

In the 638 cases which I report, which I have either delivered personally or supervised, I have no deaths to report. I have had four deaths in cases which I have attended, but delivered by others outside of the hospital. Three of these were delivered by midwives, all of whom were infected when I was called; and who all had the placenta still in the uterus. The earliest time at which I saw any of these three cases was the third day after delivery; to the latest case I was called five days after labor. This last case was suffering from a very severe postpartum hemorrhage, which

I found to be due to the retained placenta. The fourth death was one where there had been no attendant at the time of delivery; the woman died soon after of heart failure.

The claim which I desire to make is, that our low mortality is due primarily to two causes: first, absolute cleanliness of the physician and the external genitals; and second, non-interference with the normal secretions and functions of the patient. By this last I mean that for several years we have entirely discarded the vaginal douche before, during, and after labor, which robs the patient of the natural mucous protection to the bleeding mucous membranes, and also of that secretion which, in itself, is to a high degree germicidal. When I say that a vaginal douche is not used, I do not mean that such a condition as the probable existence within the genital parts, or the introduction from without, of some septic material, would not permit proper removal, which is demanded. This condition must be necessarily rare.

It is always true that the mortality of the hospital service is high compared to the results obtained by many practitioners, for the reason that the hospital receives not only the average run of difficult cases, but many which cannot be successfully delivered at home. For this reason I claim that our procedure or treatment of the puerperal woman should command attention, for, as I have stated, in the past five years there has been no mortality of the mothers delivered in our institution, in spite of the fact that a large number of these cases had present six or seven senior students from the West Penn. Medical College, who, as a rule, made two examinations.

The second factor in this low mortality, and the principal one which has caused me to prepare this article, is that of little interference in the puerperium, although we do see many cases in which the temperature within the first two weeks, even after the first fall after labor, will reach anywhere from 101° to 105° . Many and many a time it has required the most careful supervision to prevent the resident assistant from giving some treatment which to him seemed to be demanded. Quite often I would request the assistant as well as the nurse to leave the patient entirely alone for lengthy periods.

The old teaching that a temperature persisting above 100.4° for twenty-four hours should be considered septic, has resulted in many a physician thinking that through some unknown way the patient has been infected, and immediately seeking to remedy the

difficulty by the use of vaginal and intrauterine douches and that deadly weapon, the curette. It is only in those cases in which I believe we have a condition of sapremia, the action of the saprophyte upon the decomposed secundines, blood-clots, etc., as evidenced by the existence of temperature, fetid odor, etc., that the vaginal douche is used. Very rarely is the introduction of the douche into the uterine cavity necessary.

In the cases which I have mentioned there has been none in which the curette has been used, and I firmly believe that had I followed the old custom and advice of others in some of these cases, I would have opened up a way for sure infection to take place and death would have followed in some instances. The cases herein referred to have been confinements at or near full term. I do not dispute the use of the curette in many cases following abortion; in these it is often the only way in which we can remove the retained membranes, etc.

The occurrence of a temperature during the puerperal state is due either to some of the causes which we have primarily indicated may act reflexly, or to the results of bacterial infection. Should the bacteria act only as saprophytes within the internal genital organs, or as it is considered without the body itself, the products of their action when absorbed will cause, at any time, an elevation of temperature often reaching 103° to 104° or more, with acceleration of the pulse and a fetid discharge. These are the characteristic symptoms, and while the occurrence of this sapremic condition is not frequent, yet the result obtained by the removal of these products is both astonishing and rapid.

On the other hand, the entrance of the bacteria themselves into the lymphatics and circulation or into the pelvic structures, producing inflammation of the various parts with localized or general peritonitis, produces symptoms which are unmistakable and more difficult to treat. The matter of the diagnosis of the condition in the puerperal state is, to my mind, most important. With an elevation of temperature running anywhere from 101° to 105° , one wonders as to its cause. The higher the temperature, the more rapidly one acts. The statement of Ziegler that the appearance of fever is generally associated with ill feelings is nowhere more convincing than in the puerperium, especially where infection has taken place. Although it is possible for a condition of infection with the resulting high temperature to exist without at least some general symptoms, this is rare; and if upon examination one learns that the

patient is in excellent spirits, with no headache, no abdominal pain, no great acceleration of the pulse or marked increase of tension, no chill, no fetid odor in the lochia, no vomiting, it is almost conclusive that one must look elsewhere than to infection. Even the existence of headache, and abdominal pain due to distention, etc., may be caused by many of the non-infectious conditions.

The appearance of the acute infectious diseases must of necessity call for more accurate diagnosis than when not complicating the puerperium; and, while cases of typhoid fever and malaria can and do occur in the puerperium, it is very sad that many times, in order to deceive the family, or through real ignorance of the actual condition, this diagnosis is made while the case is one of true septicemia with the very frequent concealed foci of disturbance. In our 638 cases, we record 6 cases of typhoid fever and one of smallpox. These are the only instances of so-called infectious fevers complicating the puerperium of any of our patients.

Having decided between the infectious and the non-infectious cases, it is generally easy in the non-infectious ones to find a cause, although I have 12 cases to report which maintained a temperature of 100.4° for three days or more, and returned to normal, yet had no distinctive symptoms whatever, and in which the cause of the elevation of temperature was not apparent.

Of the 638 cases, 124 had a temperature of 100.4° at some time. Many of these existed during the first few hours after delivery, and I have included these in the classification as nervous ones, for the reason that in hospital practice more than in private, especially where brought into contact with a large number of students and often having no father for the baby, it is quite natural that they should develop a degree or two above normal at that time.

Of the 124 cases, I find the causes as follows: typhoid fever, 6; mastitis, including irritated breasts, 15; neuritis, 4; tubercular peritonitis, 1; sapremia, 9; smallpox, 1; eclampsia, 3; acute puerperal tympanitis, 4; nervous, 39; constipation, 30; no cause, 12.

TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

Meeting of October 10, 1905.

The President, J. RIDDLE GOFFE, M.D., in the Chair.

SPECIMEN OF UTERUS, TUBES, AND OVARIES, THE UTERUS CONTAINING IN ITS POSTERIOR WALL A FIBROID TUMOR.

DR. JAMES N. WEST.—This uterus contained in its posterior wall a fibroid tumor eight inches in diameter. The right ovary had been the seat of a large abscess, and the right and left tubes had been distended with pus. Growing from the endometrium covering the myoma was a papillary carcinoma. The patient was 52 years old and had been complaining of irregular bleeding and an enlargement of the abdomen for two years. Menopause four years before. She complained of weakness, irregular bleeding, and progressive enlargement of the abdomen. A diagnosis was made of fibromyoma, with malignant disease of the body of the uterus and a cystic mass in the cul-de-sac of Douglas. A complete hysterectomy with removal of the tubes and ovaries by the abdominal route was performed. In freeing the adhesions, the abscess of the ovary was ruptured and a large amount of pus was spilled in the pelvis, which was promptly flushed out with one-half strength peroxide, followed by hot saline solutions. The peritoneal layers were sewed together on each side down to the vagina. A small roll of washed iodoform gauze was packed into the cul-de-sac, the end being brought out through the vagina. The time occupied by the operation was forty-five minutes. There was but little blood lost, and practically no shock. The patient made a satisfactory recovery. The gauze was all removed one week after the operation. The special features of this case were the unusual number of pathological processes present, the two distinct varieties of neoplasm occupying the body of the uterus, the rapid growth of a fibromyoma after the menopause, and the absence of pain in the presence of extensive purulent inflammatory processes.

DR. HERMANN J. BOLDT.—Dr. West's remark that atypical irregular bleeding caused him to make a diagnosis of malignant disease cannot be considered to be the rule. In myomata we quite often have atypical bleeding. The rapid growth of the tumor is, however, sufficient reason for making a probable diagnosis of degenerative changes occurring in the neoplasm. Here it is an independent process altogether. The malignant degeneration accompanying the tumor is in this instance independent, only coexisting with the neoplasm.

DR. GEORGE T. HARRISON.—I believe that Dr. Boldt has mistaken the point Dr. West made. He thought the irregular bleeding pointed to malignancy because of the fact that the growth had remained quiescent for some time after the menopause, and then bleeding of an atypical character began. *That* in connection with the rapid growth, he thought pointed to malignancy. It was not the atypical bleeding alone. It is the universal experience that myomata undergo retrograde metamorphosis at the time of the menopause; when such does not happen, it is because of some complication. Of course, when myomata become the seat of cystic degeneration, they enlarge. Other forms of degeneration may appear, with like result, but, as a rule—and I do not think you can take exception to it—they *do* undergo retrograde metamorphosis.

FIBROMA OF THE OVARY.

DR. G. H. MALLET.—Solid tumors of the ovary form only about 5 per cent. of all ovarian neoplasms. They may occur either in the ovary or ovarian ligament; in the ovary they form hard, painless tumors, and might be found in quite young women. Free fluid in the peritoneum was noted in five out of eleven cases by Doran. On section, ovarian fibromata consist of characteristic wavy bundles of fibrous tissue packed together as in ordinary uterine fibroids. The specimen shown was from a patient 48 years old, who had nothing unusual about her menstrual history except that for the last four years her flow had been more profuse than formerly. She had four children, the youngest eight years ago. About seven years ago she had consulted a physician because of a pain in her left ovarian region. A small tumor was then discovered. Since that time she had increased in size and had a feeling of weight in the abdomen and pain in the back. A diagnosis of pedunculated fibroid of the uterus was made. Upon opening the peritoneum a quantity of fluid escaped. The tumor was found to be a fibroid of the ovary. The patient made an uneventful recovery.

DR. A. BROTHERS.—I have seen three tumors of this character during the past few years involving the ovary. I have not met with ascites, and do not consider it to be of value as a diagnostic sign of this type of tumor. Last summer the question of differential diagnosis was brought up, as the possibility of a movable kidney came into consideration. Two prominent gentlemen (one a surgeon, the other a gynecologist) made the diagnosis of movable kidney, and went so far as to order for the patient an abdominal supporter. The symptoms which suggested a movable kidney were caused by a torsion of a long pedicle attached to a right-sided fibroid tumor of the ovary. There was acute pain in the right side, and a solid mass high up in the region of the loin, which I was satisfied at first could be pushed up further. It would be interesting to know whether any members of this

society have met with such tumors of the ovaries, particularly with long pedicles, which had been mistaken for movable kidneys. The patient I referred to was operated upon by me and got well.

UTERINE MYOFIBROMATA AND VISCERAL DEGENERATION.

DR. H. J. BOLDT presented this paper. He said that in looking through the standard text-books on medicine for information as to the connection between fibromata and heart disease one found nothing, though the close condition between these two affections had been frequently alluded to in gynecological literature. The circulatory symptoms frequently observed in patients having uterine fibroids suggest that there is some relation between these neoplasms and the circulatory system. Cardiac changes in women having fibromata occur too often for one to consider them as a mere coincidence. Dr. Boldt said that since 1903 he had had 79 cases of myofibromata, and in 37 patients, or nearly 47 per cent., some circulatory disturbance was noted. These were classified as follows: *Class I.*—Five patients had dyspnea on exertion, also a small, rapid pulse, with arrhythmia. There was moderate hypertrophy of the right ventricle. The urine showed albumin and casts on one occasion. *Class II.*—One patient had orthopnea and irregular and intermittent pulse; increase of dullness over the entire cardiac area, albumin and casts in the urine. *Class III.*—One had an arrhythmia, hard pulse, with occasional attacks of angina pectoris. There was a trace of albumin in the urine and some granular and hyaline casts. *Class IV.*—Nine had a rapid pulse, from 100 to 112, which increased on sudden exertion from ten to twenty beats. The pulse was small and easily compressible. The urine was normal. *Class V.*—Twenty-one patients complained of symptoms referable to the heart, the pulse was small, of low tension, occasionally irregular, and from 86 to 110 per minute. Pain on pressure with the point of a finger over the apex alone was observed nine times. Pain on pressure over the second intercostal space was noted five times. Traces of albumin were noted three times. There was no appreciable change in the heart area in any of these cases. Thirty-four were operated upon and five died after the operation. One of these belonged to Class I, one to Class IV, and two to Class V. In considering the clinical pictures of the instances of death, one must regard the degenerative condition of the heart muscle as having been to a large extent a cause of the fatal termination. Of the patients operated upon, five did not have bleeding as an indication for operation. The blood in all the cases was more or less altered from the normal standard. In four instances among the foregoing number there was thrombosis of the veins of the lower extremity.

Dr. Boldt gave an extended review of instances in which gynecologists have reported cases where myomata were accompanied by cardiac degeneration. Strassmann and Lehmann re-

ported that they examined 71 myomatous patients at the Imperial Charité, and of 63, of whom notes were taken, albumin was present in the urine in 17.5 per cent. There was dilation of the right ventricle in 11 per cent., of the left ventricle in 15.5 per cent. Dilatation of the left ventricle, with atrophy of the right ventricle, was noted in 3 per cent. There was irregular heart action, exclusive of the cases of dilatation, in 5.6 per cent. There was a total of 40.8 per cent. in whom there were found positive anatomical heart lesions. Wilson, of Birmingham (*Lancet*, May 12, 1900), maintained that cardiac disease could only be caused by pressure of the tumors on the ureters or kidneys. He believed that anemia, as the cause of hemorrhages from myomata, was most frequently responsible for dilatations and degenerations of the heart. He had also shown that the conjunction of serious affections of the heart with the presence of a fibroid was sometimes casual, but in a much larger number of cases the connection between the disease of these two organs was causal, the heart affection being set up by the growth of the fibroid, both being dependent upon a common cause. He spoke of the valuable contribution made by Kelly, who says that, as a rule, the heart is enlarged by various degrees of dilatation. The heart action is visible and palpable, but not always irregular or intermittent. The number of cardiac contractions may be influenced by the psychical condition of the patient. The increased intensity of the apex beat and the accentuation of the second sound at the base lead to the impression of cardiac hypertrophy. On auscultation usually nothing characteristic is heard except a dull first sound at the apex and intensified second sounds in the large arteries. The pulse was dependent upon the cardiac action.

Although the diagnosis of myocardial degeneration in many instances must remain doubtful, yet when there was increased action, diminished action, irregularity, intermittence, or incomplete contraction, in connection with clear sounds, there could be no doubt of the presence of a degenerative process of the myocardium. Malignant changes in the tumors did not so frequently give rise to serious results as did the degenerative changes in the circulation. He considered it erroneous to make statements that the mortality from operations upon fibroids was only two per cent., because the mortality from pulmonary embolism nearly equaled that rate. It was unfortunate that in instances of death following operations for these tumors it was not possible to have a careful autopsy with a microscopical examination performed in each instance. In all instances of death following his operations in which an autopsy was made, some degenerative change was always found in the heart muscle, whether the diagnosis of a cardiac lesion had or had not been made before the operation, and whether or not the neoplasm had given rise to metrorrhagia or menorrhagia. George Winter (*Zeitschrift für Geburtsh und Gynak.*, Vol. IV, pp. 49 to 154), in studying the records of 52 postmortem examinations of myo-

matous patients, the majority of whom died after the removal of the tumor, found a normal heart in only eight cases. Some of these cardiac changes might be attributed to the fatal illness, principally infection, and in some instances it might be attributed to other causes than the myoma. Two hundred and sixty-six cases examined at the Konigsberg University Hospital showed perfectly normal conditions in 60 per cent. There were murmurs in 30 per cent. The cause given for the murmurs was anemia, 52 times; probable anemia, 16 times; arteriosclerosis, 6 times; neurasthenia, twice; fatty heart, twice. There were dilatation and hypertrophy 16 times; primary mitral insufficiency, once; mitral stenosis, twice; changes in the myocardium, three times. Winter observes that the cardiac condition of some patients was benefited by the removal of the myofibroma. On the whole, Winter believed that the influence of myofibroma in the causation of heart disease had been greatly exaggerated.

The scientific method of getting at the exact relation of myomata and the heart and other internal organs was to have a competent diagnostician in internal medicine make a careful examination of each patient with a myofibroma, and to have the same diagnostician examine the patient some time after the operation, if one has been performed, and if the neoplasm was supposed to have given rise to the changes in the internal organ. In case of fatal termination, there should be a careful microscopical examination as well as a macroscopical examination. Some authors maintain that a myomatous patient with a heart lesion is more liable to an intercurrent affection after an operation, such as sepsis, peritonitis, etc., than one who has a perfectly normal heart. Dr. Boldt said that women who had sustained large losses of blood frequently showed symptoms of anemia, edema of the lower extremities, and more or less albuminuria. These symptoms often disappeared on the cessation of the bleeding. That such effect on the heart was not alone caused by menorrhagia and metrorrhagia was proved by the fact that degenerative changes were seen in patients who had not suffered such large losses of blood. There was no particular form of cardiac degeneration distinctly attributable to myomata, but there were various pathological conditions of the heart, blood vessels, and kidneys frequently associated with these tumors, and profuse hemorrhages manifested themselves sometimes in fatty degenerations and brown atrophy of the heart muscle. Clinical experience taught us that patients with myomata had weak heart, especially if the tumors had obtained considerable size.

There could be no question that patients with fibroids of long standing had their resistance to anesthetics impaired. This lack of resistance frequently manifested itself only when an operation was undertaken, because at that time tax upon the respective functions was at its height. If the heart affection was the primary condition, then the removal of the tumor could have no effect upon it, but the fact that removal of such tumors has pro-

duced a beneficent effect upon the heart shows that there is a connection between myomata and the circulatory apparatus was found in the fact that arteriosclerosis of the ovarian vessels was frequently found, also in the pathological changes in the constituent elements of the blood. Myomatous patients frequently began to menstruate late, had a profuse flow, and suffered from dysmenorrhea. The mechanical changes in the heart, like dilatation and hypertrophy, had a position subordinate to the myocardial changes. The changes in the blood-vessels in the vicinity of a myoma had an important bearing on the occurrence of emboli. While the size of the tumor did not bear any positive relation to the degenerative changes in the heart muscle, it must be admitted that such changes were more likely to be present in tumors of large size when they extended above the umbilicus, especially if hemorrhage had been a prominent symptom. The practical deduction to be made was that subjects of myomata should be especially well fed and take sufficient exercise during intervals of bleeding and menstruation. They should have such diet and exercise as would tend to reduce the adipose tissue and increase the muscular tone. They should be advised to have the tumor removed; cardiac and renal changes, unless hopelessly advanced, being an indication, rather than a contraindication, for their removal, because patients who have myomata succumb more readily to cardiac insufficiency if attacked by an intercurrent disease. Treatment should be directed to the heart before an operation, if myocardiac symptoms were present. Intravenous infusion should be employed at the beginning of the operation if the hemoglobin was materially reduced. After the operation such patients should receive heart treatment to act against the formation of thrombosis. In every instance in which he had had the adnexa and the endometrium of myomatous patients examined—and that had been in more than 100 cases—inflammatory conditions had been found in these structures.

DR. J. McE. EMMET.—I have listened to the paper read by Dr. Boldt with great interest, and have really heard much more than has come under my notice, and he has given me much to think about. I believe that, as Dr. Boldt has stated, many conditions are present which many of us fail to recognize, either through haste or neglect to fix our attention upon certain details, and, therefore, we overlook many points which have a bearing upon both the present and future of the patient. I think, too, that if one studies certain points and seeks to develop them, one may magnify some features and too much importance may be attributed to them. Of course, important pathological facts pertaining to a given case should be amplified and made to stand out prominently. These, when studied carefully, may be found to corroborate a belief in the interdependence of the two conditions. I think that if we take the consensus of opinion of those present, however, and review the experiences of ten, fifteen, and

twenty years, or more, it will be found that each one will have seen a large variety of diseases both of the heart and of the kidneys, in conjunction with fibroid tumors of the uterus, but that they are not so generally present as the paper just read would lead us to believe, nor do I think they, of necessity, stand in the relation mentioned. I hold that every case of pelvic disease that comes to us should have a general physical examination, and that every element should be given its due importance. Yet I do not wish to overlook the point that in cases of long standing patients with fibroids of the uterus have suffered much from loss of blood, loss of appetite, lack of exercise, and, in fact, a loss of nearly all those conditions which are conducive to health. Where a mass may press upon vessels, whether it affects the kidneys or the circulation of the heart, without producing a change in the endocardium, or the muscular structure of the heart itself, we can readily see how such cardiac and renal symptoms occur, and we may frequently correct them by removing the cause. Again, we must always take into consideration how many such cases there are which exist independently of the lesions in the pelvis. I think we may often be in error in associating such conditions as cause and effect. Seldom are signs present pointing to cardiac lesions; often, also, when present they may be lost sight of because the patient makes slight mention of them, or else places them in the background. Again, conditions might arise from excitement or manipulation of a tumor developing heart sounds, slowing or quickening of the pulse, etc., which might be misleading. Examination of the condition of the kidneys should be more often made, and I think more attention should be given to this than to the condition of the heart. The changes there are very much more vital, and we have conditions of nephritis established which are insidious and which may suddenly flare up; whereas conditions of change in the heart are more slow. The complicating kidney conditions may be improved by treatment. I will allow that the association between cause and effect may be sometimes established by operation. At the same time I believe that often the wish is father to the thought, and we may come upon too many of them in our daily practice. The tendency to-day is toward the early removal of these growths—to insist upon their early removal; it is especially wise, if a co-existing lesion can be found, to attack the tumor at an early date.

DR. JOSEPH BRETTAUER.—I have rarely listened to a paper that has been more extensive and detailed than the one read to-night. At the same time I disagree with some of the views taken. I do not attribute much importance to lesions of the heart which co-exist with uterine fibroids; if we will compare 100 cases of fibroids coming to us with 100 cases without fibroids coming under our observation, I think we will not find any difference in the condition of the heart. Those of us who are connected with hospital service and see a great many cases will find in the general run of cases of lacerated cervix, or lacerated perineum, just

as many heart lesions as in those with fibroid tumors. I do not want to be understood as saying that women who have lost an excessive amount of blood for years will not ultimately develop hemic murmurs and fatty degeneration of the heart muscle; that, as a rule, is a natural consequence. But I agree with Dr. Boldt that heart lesions found in women who bleed profusely from uterine fibroids do not contraindicate but rather indicate operation.

DR. LEROY BROWN.—It is a fact well recognized by the profession at large that cardiovascular conditions are a sequel of fibroid tumors in which profuse hemorrhage exists. This is to be expected since the resulting anemia produces a malnutrition of the heart muscle, as of the rest of the animal economy, causing in extreme cases a fatty degeneration. There is, however, another class of cases, in which the tumor is not large and in which there has been no hemorrhages. Here at times we find a hypertrophy and dilatation of the heart present. Wilson, of Birmingham, in a paper in 1885 (referred to by Dr. Boldt), cites, among others, three such cases occurring in his own practice. In each there was a heavy cardiac impulse and the percussion dullness was extended to the left. The removal of the uterine tumor in two of these instances made in a comparatively short time a remarkable improvement in the cardiac condition. The third case was lost sight of after the operation.

In connection with this class of cases, I can relate the history of a patient given me by Dr. Ewing of Nashville, Tenn. The patient had been under his care for many years, during which time he had a positive knowledge of the normal condition of the heart. In the course of his care of this patient a fibroid tumor of the uterus developed. Subsequently, after some years of the growth of the tumor, during which time there had been no marked uterine hemorrhage, the patient complained of symptoms referable to the heart. On examination a hypertrophied and dilated heart, associated with a valvular lesion, was found. The patient eventually died suddenly of an acute heart failure and pulmonary congestion. In this case it seems to me that the relation of cause and effect is very evident.

The classes of cases already mentioned belong to those in which the involvement of the heart can be recognized by physical examination.

There is another class of equal, if not greater, importance, in which there are myocardial changes. These changes cannot be recognized on physical examination unless the change should be extreme. They are only recognized either at the time of operation or immediately after in the severity of the shock, which is out of proportion to the length of the operation or the amount of blood lost.

Fleck, in his article that has been referred to in the paper of the evening, mentions such a case, in which immediately following the removal of a myxomatous tumor the pulse rapidly weak-

ened and within three days all symptoms (the cold extremities and the weak pulse) pointed to profound sepsis. The patient improved and went on to recovery, which was not further interrupted until the time of getting up, when the same symptoms of weak pulse, fainting and cold extremities, repeated themselves.

Fleck speaks of the "myoma heart" as being a condition well recognized by Continental anesthetists, and describes the slow, arrhythmic pulse as being indicative of such a condition. In speaking to two prominent anesthetists of this city, they tell me that they have never observed this condition. They, however, use ether, and Fleck states that the condition is not so evident with ether.

Dr. Denton, however, tells me that his experience leads him to expect severe shock in the removal of fibroid tumors more than in any operation of like duration or severity, unless it is for stone in the common duct.

Hofmeyer, in a paper in 1885, collated eighteen sudden deaths from heart failure in patients who had fibroid tumors. Fifteen of these showed, however, atrophy of the heart muscle, and three fatty degeneration.

DR. BROOKS H. WELLS.—I have listened with much pleasure to Dr. Boldt's paper, and the remarks of the gentlemen who have preceded me, yet my own experience does not lead me to believe that the mere presence of a small fibroid in the uterus has any marked effect in producing disease of the heart or arterial system. Most patients complaining of fibromyomata of the uterus are between the ages of 30 and 60, and a certain proportion of these will have cardiac or vascular lesions from causes entirely independent of their fibroids. Others have the lesions found in the presence of any large abdominal tumor that changes the dynamics of the circulation or produces marked and long-continued anemia.

Years ago, when it was the custom to treat all cases of fibroids with ergot in large and long-continued doses, and when the operative mortality was enormous, I had the opportunity to see many autopsies on these patients. A large proportion showed brown atrophy of the heart, but I always considered this due to chronic ergot poisoning and not to the effects of the fibroid *per se*. Now ergot is not used, yet to prove that any certain lesion of the heart found at autopsy was caused directly by the fibroid, we would have to exclude as causes rheumatism, which is apparently frequent with fibroid, sepsis in its many forms, continued anemia, and other well-known causes. So in cases of small tumors accompanied by cardiovascular changes, I am disinclined to believe that the fibroid has anything directly to do with the heart lesion.

DR. CLEMENT CLEVELAND.—I certainly can add nothing to what has already been said. I have been much impressed with the paper just read, and I am surprised to learn that there are so many lesions of the heart that occur in connection with fibroid tumors of the uterus. I have always noticed that, in some cases, there were lesions of the heart found in connection with fibroid

tumors, and I have always felt that there must be some connection, or direct relation, between them. But I have never been so thoroughly impressed with the fact as to-night, although I have looked upon it as of great importance. Believing, as I do, that in the majority of cases fibroids should be removed, these facts brought out by Dr. Boldt furnish to me additional arguments in favor of operation.

DR. J. MILTON MABBOTT.—I remember an occasion twenty years ago when I was present at a clinic of Dr. Thomas'. A colored patient came into the room and Dr. Thomas said to the class: "Gentlemen, I think I can make a diagnosis in the case of this patient by looking at her face." Turning to his chief of clinic, he said: "She has a fibroid tumor of the uterus. Has she not, Dr. Ward?" Receiving an affirmative answer, he said to the woman: "That will do; you may go." The class applauding, he remarked: "Gentlemen, I do not deserve your applause, because eight out of ten colored women over 35 years of age have fibroid tumors." Dr. Thomas felt safe in assuming further that this was probably not what she came in for, but for something entirely different. Dr. Ward corroborated this also. Dr. Thomas therefore had certainly come very close to stating that in his opinion fibroid tumors occurring in women were generally unimportant and not deserving of much attention. I have been fourteen years in the outdoor department of the New York Hospital, and I find that colored women have fibroid tumors which do not grow to be large in many cases, and do not seem to influence their general health by their presence. In my rather slight experience with the colored women of the North I do not find that they are more subject to rheumatism than the white woman. The colored children are certainly very commonly subject to rickets, and many of these rachitic children may be rheumatic. Heart disease and other conditions may be caused by loss of blood indirectly affecting nutrition. But fibroid tumors must also, in many cases, exert a reflex influence through the central nervous system, having a deleterious influence on the general health, rendering the patient more prone to disease of the arteries and secondarily of the heart and kidneys.

DR. HERMANN J. BOLDT.—My object in presenting in this paper principally cardiac lesions is because the literature shows this organ to be chiefly affected when the patient suffered from uterine myomata; in going through that literature I found that the liver and the kidneys were comparatively seldom, but in many of the cases the heart was affected, and there were reported cases in which pulmonary embolism was quite frequent, as well as thrombosis of the pelvic veins. I agree that so far as the practical value is concerned, not so much importance need be attached to the connection between myomata and heart disease as some writers would have us believe. For this reason I have quoted also the abstracts from the work of Winter and Englemann. They take a somewhat different view of the matter. Nevertheless, there is no

question about it but that myocardial changes do exist more frequently than is usually supposed. I believe that macroscopical findings alone are insufficient to determine these changes, and that it is necessary to make such a microscopical examination as has been done in a number of autopsies, where the unaided eye did not show the lesions.

I feel that I have been fully repaid if my paper has acted as a stimulus to the members of the society to cause them to look into the subject more carefully, and particularly to obtain autopsies when they have been unfortunate enough to lose patients after operation.

TRANSACTIONS OF THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON OBSTETRICS.

Meeting of October 26, 1905.

DR. CHARLES F. ADAMS *in the Chair.*

THE evening was devoted to the consideration of ectopic pregnancy.

TOXEMIA IN EARLY ECTOPIC PREGNANCY.

DR. BANDLER reported the case of a multiparous woman who had been sterile for 12 years. She was 42 years old and had passed her menstrual period two weeks and a few days. Four or five days prior to admission to the hospital she complained of pain in the abdomen. On the day following she began to vomit and vomiting continued every day until her admission. Because of the vomiting a diagnosis of appendicitis was made by her physician. The house staff examined her carefully, and from the history and physical signs reported it to be an ectopic gestation. When the patient was admitted (pulse 140) she was delirious and there was marked vomiting. There was a tremendous hematocoele with more fluid black blood than he had ever seen in similar cases; it was unclotted. Nothing otherwise unusual was to be noted on operation. The vomiting continued two days after operation and then was relieved by washing out the stomach. But the pulse (120-150) and general condition were not what they should have been and the patient died, having been delirious since the operation. In the last 18 hours before death only one ounce of urine was passed, in spite of hypodermoclysis and rectal high saline enemata. Autopsy was refused. The abdominal wound was, however, allowed to be reopened. On account of the delirium it was thought that the case was possibly one of toxemia of pregnancy. There was no blood in the abdominal cavity and no signs of peritonitis. A piece of the liver and one kidney was removed, and on examination the former appeared to be normal, at least there was no yellow atrophy or the lesions of Schmorl. The kidney had not yet been examined with care. So

far as he could determine, the case was one of toxemia of pregnancy occurring early in ectopic gestation. One case like this had been reported by Paltauf. Still it might be one of uremia, and this could not be determined until the kidney had been more carefully examined. He would report later the findings.

DR. WILLIAM S. STONE, in speaking of Dr. Bandler's case, said that it was a very suggestive one, and although not yet substantiated by anatomical proof, he believed it was in all probability a case as suggested, *i.e.*, one of toxemia of pregnancy. In affirmation of this, he referred to a case reported in the literature. Such an intoxication might occur in connection with hydatiform mole. He believed that Dr. Vineberg's argument against the possibility of adhesions as the result of inflammatory action as a cause of ectopic gestation was efficient. Cases had been reported in which adhesions were present and the women became pregnant subsequently. In his own experience he had learned that it was hazardous to express a prognosis as to a subsequent pregnancy.

SPECIMENS OF ECTOPIC PREGNANCY.

DR. S. M. BRICKNER presented five specimens selected with reference to the remarks he expected to make later.

1. The woman from whom this specimen was removed entered the hospital immediately following a rupture of a tubal ectopic pregnancy. The interest centers largely in the fact that there was present simultaneously an ovarian cyst.

2. This specimen was removed from a woman who entered the hospital with a diagnosis of tubal pregnancy, with a pulse of 80 and general condition very good. One hour after admission she began to show signs of internal hemorrhage and, without waiting for permission to operate, the condition being so alarming, she was operated upon. The site of the rupture was shown together with the remnants of the sac in the tube and a few blood clots. The fetus had escaped. The patient made a good recovery.

3. The history of this case was rather dramatic because of the anatomical features. This patient was admitted to the hospital as a private patient, and because of the presence of infection in the institution, operation was postponed for twenty-four hours. On the same evening he saw one of the ward patients and, as a matter of courtesy, he visited this patient and discovered that she was almost moribund, pulseless and in a condition of collapse. She was hastened to the operating room, an abdominal incision was made, the abdomen was found to be filled with blood, a ruptured ectopic was found, and the time consumed in all was twelve minutes. The patient had been ringing the bell for some time for the nurse, who refused to respond, thinking she was simply nervous; had he not entered the room when he did, no doubt she would have died. The specimen showed a rupture in the center of the tube. She recovered.

4. The patient from whom this specimen was removed was operated upon by Dr. Brettauer. It showed a particularly tortuous

tube which was the site of an abortion, the aborted ovum being seen outside the fimbriated extremity.

5. This specimen was shown because of a simultaneous intra and extrauterine pregnancy. Abortion occurred apparently at two and a half or three months. Nothing whatever was found in the appendages when the patient was curetted. Three weeks after this was done the patient complained of pain in the right side with a continuation of the flow, and a diagnosis of tubal pregnancy was made. At the time of operation the fetus was found lying in the abdominal cavity. The tube itself was the seat of a mole.

DR. EGBERT H. GRANDIN presented the following specimens:

1. The first was a double ectopic pregnancy, one of three that he had in his first series of ectopics. The ovum was shown on one side, approximately of six weeks' life. In the other tube abortion had just taken place. He left the ovary behind. The history was atypical.

2. This specimen was interesting in that it demonstrated the reparative efforts of nature. When the patient entered the service she was in a condition of collapse. The abdomen was opened, the fetus removed; it was developed about to the twelfth week. The abdomen was filled with blood and clots extending as high as the ensiform. The patient made a good recovery.

3. This specimen was removed from a patient who gave a history of repeated ectopics. Some time in 1902 he removed a ten weeks' fetus in an unruptured tube; three years after, in 1905, he removed the left unruptured tube containing a fetus of about six weeks' development. In this case both ovaries were left in and the patient menstruated.

4. This was a specimen of right ectopic gestation with atypical history, one not at all in accord with the histories laid down in the text-books. She entered the hospital with a pulse of 160, temperature 101, and respirations 35. The diagnosis of a presumptive ectopic gestation was made and the abdomen opened. A right salpingo-oophorectomy was performed which was followed by an uneventful convalescence. The same operation was performed on the left side at the same time.

5. This was another specimen of a right ectopic gestation with atypical history, the diagnosis being only presumptive. A right ectopic of six weeks old was removed, the right ovary and tube being removed as well.

6. This was another specimen of an ectopic, the abdomen being filled with blood and clots as, in fact, all the cases had. All the cases recovered.

Dr. Grandin said that his experience with a large number of cases of extrauterine pregnancy had led him to the following conclusions: (1) The symptomatology was rarely typical; (2) if he regretted one thing more than another it was in extrauterine pregnancies when the other side seemed to be not quite normal, not removing that tube. He said he could recall four cases, at least, of repeated ectopics. While the women got well, they felt that one

was not doing his full duty at the first operation in not removing the tube apparently diseased and thereby saving them the risks of a second abdominal section; (3) he was satisfied that, except in hematocele formation, the only surgical way of operating was by the abdominal route.

DR. HERMANN J. BOLDT presented a specimen of double tubal pregnancy. L. L., aged 35 years, married fifteen years, had had two children, the last one fourteen years ago. Four months ago she was seen by her physician, because of the presence of nearly constant bleeding for the past few weeks, and it was assumed both by the patient and the doctor that she was pregnant about four and a half or five months. It was requested that Dr. Boldt should decide whether it would be advisable under the circumstances to empty the uterus. On examination the uterus was found to be somewhat enlarged and relaxed in consistency, boggy, and could be pushed forward and was practically immobile. Behind the uterus was a mass, globular in shape, very sensitive to touch, and about the size corresponding to a tumor three inches in diameter. In close connection, inseparable from the mass, and also in direct connection with the uterus, was an elastic tumor having the size and shape of a gravid uterus about the fifth month of gestation. It had not, however, the same definite outline as a pregnant uterus, and the uterus could be mapped out independently of the large, seemingly uterine tumor, and was a little to the left of the median line and pushed well forward. The uterus and the elastic tumor formed an intimately blended mass. Feeling confident that the uterus did not contain a fetus, a sound was introduced and its depth was found to be three and a half inches. Further questioning now elicited the fact that the patient had had a sudden attack of severe pain on the 19th of April. Its site was in the lower abdomen more towards the right iliac fossa. At present there was more pain in the left side. The appearance of the woman was anemic. The diagnosis of secondary abdominal pregnancy was made, with the presumption that the primary rupture or tubal abortion took place on April 19. The woman was admitted to his service at St. Vincent's Hospital, and on operation the omentum and intestines were found to be intimately adherent together, and as a mass attached to a tumor which felt to be cystic in some parts, and solid in others. This tumor lay in the median line and extended to the right. It was attached to the right broad ligament and to the intestines, and was also intimately adherent to the uterus, which was not increased in size to any marked extent. Behind the uterus, on the posterior surface of the fundus, was a hard tumor, which was recognized as probably a fetal head. The capsule of this tumor was accidentally opened while endeavoring to enucleate it from the surrounding tissues, and a thick, creamy fluid escaped, which impressed him at first as pus; there was no odor, and after closer inspection it was thought to be broken down brain. All the skeleton bones were encapsulated in what seemed to be the skull, and apparently arranged on top of each other like cord-

wood. The large intestines were extensively injured during separation of the adhesions, but were sutured without requiring resection. This fetus was the product of a left tubal conception, as the condition of the enlarged, thickened Fallopian tube indicated. The large mass on the right side was thought to be placenta. The surface oozing from the separated adhesions was profuse. Both ovaries were retained and attached to the cornuæ of the uterus, although both glands were enlarged and inflamed. The oozing surfaces were tamponed with a Mickulicz tampon and the abdomen closed up to the exit of the tampon. The patient made a slow recovery, the time being lengthened by the occurrence of a fecal fistula which, however, closed spontaneously. The pathologist's report showed that he was in error in taking the semisolid tumor on the right side to be the placenta. This proved to be another extrauterine pregnancy, according to the report, about two and a half months' gestation. This was the second double ectopic pregnancy that he had had an opportunity to operate upon this year.

DR. L. J. LADINSKI presented a specimen removed from a patient 23 years old. She had been married nine months. Her menstruation had always been regular, lasting from five to six days. She never had skipped a period, but had been flowing for 17 days prior to admission to hospital. She also had a yellow discharge. She had been treated during the past five months for gastric ulcer. Two days before admission she was taken with violent abdominal pains and vomiting. There was marked pain and rigidity on the right side, sometimes in upper quadrant and sometimes in the lower. There was no blood in the vomitus. A consultant made a diagnosis of gastric ulcer, and another diagnosed appendicitis, ectopic gestation or pyosalpinx. Immediate operation was advised and a ruptured ectopic gestation found.

THE ETIOLOGY OF ECTOPIC GESTATION.

DR. S. M. BRICKNER said that the theory which held apparently the greatest number of supporters was that this condition resulted from some inflammatory action about the tube, *i.e.*, a deep-seated salpingitis or adhesions about the tube which interfered with the progress of the impregnated ovum to the uterus. Yet in one of the cases presented there were no signs of any inflammatory action. He felt confident that all those present had encountered instances in which there were no inflammatory conditions present and in which none could even be revealed by the pathological examination. German writers held that extreme torsion of the tube was a cause of ectopic gestation, but that was to be doubted. Perhaps the suggestion which took the greatest hold upon the scientific mind was that of Webster, in which he considered ectopic gestation as a reversion to lower type. The fact that some women had intrauterine pregnancy and then ectopic, or ectopic pregnancy and later intrauterine pregnancy, or repeated extrauterine pregnancies was significant, and seemed to interfere with the correctness of this

theory as a cause alone. Webster's assertion was that any part of Müller's tract might become the seat of pregnancy; if it occurred in the tube, he assumed reversion to a lower type. Of course, that which would overthrow this theory would be the anatomical demonstration of a case of primary pregnancy on other than Müllerian tissue, and such an unquestioned case had been reported. That alone was enough to make Webster's theory as the sole cause of tubal or ectopic pregnancy untenable. One year ago in Vienna, Mickulicz made out a good case for accessory lumina in the tube as a cause, but he did not believe that could be cause alone, on account of untold instances in which accessory lumina were not present. It was entirely possible that in some instances we had combined elements working to produce ectopic gestation. Thus, a woman might have a salpingitis and also have accessory lumina. It was possible for these or any other two elements to be combined in the production of ectopic pregnancy. With regard to lesions in the tube itself, first there were to be considered neoplasms. Polyp of the tube had been supposed to be a cause of ectopic gestation because such a condition interfered with the passage of the ovum from the fimbriæ to the uterus. Dr. Vineberg had such an instance last summer. There were untold instances in which one found no deviation from the normal, no part apparently being involved in any neoplasm. With neoplasm of the ovary the same conditions might exist. Dr. Brickner said that, summing up all that was known concerning the etiology of ectopic pregnancy, any factor, or combination of factors, which interfered with the proper migration of the ovum to the uterus must be regarded as a causative factor. That was tantamount to saying that we knew almost nothing about the etiology.

DIFFERENTIAL DIAGNOSIS OF ECTOPIC GESTATION.

DR. BROOKS H. WELLS said: In discussing the question of the recognition and differential diagnosis of ectopic pregnancy, it will be convenient to consider it under a number of heads, as follows:

1. Early, unruptured.
2. Early, with rupture and free hemorrhage.
3. Early, with rupture and extraperitoneal bleeding and hemothecle.
4. Advanced, with living child.
5. Near, or after term, child dead.

1. *Early, Unruptured.*

The ovum may become implanted in any part of the tube, from the fimbriated end, where it is apt to result in a tubal abortion before the eighth week, to the mucosa of the uterus. In general the danger increases with the nearness to the uterus, being least at the outer end, greater at the isthmus, and greatest where interstitial. There are no pathognomonic symptoms, and the condition is easily overlooked unless we learn to suspect and watch for

it. Some cases will give no indications which attract the attention of patient or physician until the alarming signs of rupture occur. The patient is necessarily a woman within the limits of the child-bearing age. She has been previously in good health, or at least has had no serious disorder of the pelvic organs. She has usually borne children, but may not have been pregnant for several years. She comes to you and states that she has missed one or possibly two periods. During the last few days she has had a moderate bleeding from the uterus, the blood being darker than usual at menstruation and not like her usual flow. She may have passed shreds or a decidual cast. She has had some griping pain and uneasiness in one ovarian region. She has reason to suspect a pregnancy, and often thinks these symptoms indicate an abortion.

A vaginal examination shows to one side, behind, or rarely in front of the uterus, a well-defined, elastic tumor the size of a small egg, regular in outline, often with pulsating vessels, and at first not particularly tender or painful. As the villi of the fetal chorion begin to grow through the tube wall, there is apt to be some intratubal bleeding, and the mass grows harder and becomes more sensitive. The uterus is slightly enlarged and slightly softened.

Interstitial pregnancy is almost never recognized before rupture, and is marked only by an asymmetrical development of the uterus, one cornu being prominent and very tender on palpation.

This history and the physical findings mean only one thing, an unruptured ectopic pregnancy, but unfortunately they are not always so clear, and in a condition where certainty and quick action are of the utmost value, the greatest danger is in underestimating or mistaking the seriousness of the condition.

Where the diagnosis is in doubt, the following conditions may have to be differentiated:

Abortion. Do not depend too much on history and symptoms, but make a careful bimanual examination. With abortion there is no mass in tube and the uterus is larger than with ectopic pregnancy. Caution is necessary, as the curettage indicated in partial abortion might do serious harm in ectopic pregnancy.

Anteflexion of the Gravid Uterus may occur, and may occasion doubt. Careful bimanual examination should reveal it. No vaginal hemorrhage. Watch for a time if in doubt.

Retroflexion of the Gravid Uterus should never be mistaken, as a careful examination should reveal true condition and prevent the unfortunate mistake of trying to replace a gravid tube. Where there is a mass other than the fundus posteriorly, the uterus as a whole is pushed forward, the cervix looks down, and the fundus can be felt by bimanual pressure behind the pubes. A gravid uterus is often complicated by retention, an ectopic pregnancy by spotting.

Pyosalpinx. Previous ill health and long-continued tubal aching as contrasted with fair condition usually preceding ectopic.

No symptoms of pregnancy, vaginal purulent discharge, history of infection, elevation of temperature, menstruation usually regular and profuse, but may be amenorrhea for several months, both tubes show signs of disease, but one is usually much larger than the other.

Hydrosalpinx, or *small ovarian cyst* of one side, with early abortion or temporary amenorrhea, may produce symptoms almost impossible to differentiate even with closest attention to the history and physical examination.

Myoma, *Sarcoma*, or *Carcinoma* of the tube, give no symptoms of pregnancy, no recent menstrual irregularities, and are hard and irregular in outline.

Ovarian neoplasms are rare, are more movable, are not accompanied by symptoms of pregnancy or by temporary amenorrhea and bleeding.

2. *Early, with Rupture and Free Hemorrhage.*

The woman has had a temporary amenorrhea, her last regular flow having occurred eight to twelve weeks before. She has had irregular, moderate, rather dark bleeding, which has only attracted her attention as being different from her regular flow. She has probably had some of the signs of early pregnancy, such as nausea, enlargement and tingling of the breasts, etc., although in early rupture none of these signs may be noted.

Often she has considered herself in perfect health until seized with severe, sharp, colicky abdominal pain, followed by faintness, nausea, weakness, and pallor. At times she says something has given way inside of her. The pain continues; she goes from one faint to another; though curiously quiet and passive, she complains of an imperious air hunger; the weakness increases; she becomes more and more blanched, and finally death closes the scene, the patient's mind remaining clear until the last.

Vaginal examination usually reveals a tumor at one side of the uterus. Blood may be felt in Douglas's pouch as a boggy swelling. If patient is stout and the bimanual examination inefficient, there may be no obtainable sign of any tubal involvement, and we may have to act, and act quickly, on the evidence afforded by the signs of internal hemorrhage alone. The temperature is apt to be subnormal. Tubal abortion may occur when the embryo is implanted very near the fimbriated end of the tube, occurs usually before the end of the eighth week, and is marked by sudden pain and more or less shock from intraperitoneal bleeding.

Rupture in tubal pregnancy may be precipitated by mechanical extraneous causes, as coitus, digital examination, falling or jolt.

The symptoms of early tubal rupture with free bleeding are so sudden, so instant, and so characteristic, that there is small danger of their being mistaken.

One who had never seen a similar condition might think of simple *fainting from pain*, but in a faint, though the pulse may be tem-

porarily lost, when it is felt it is slow and full, as contrasted with the increasingly rapid and weak pulse of hemorrhage.

Ectopic rupture has been mistaken for *acute poisoning*, but the agitation of the patient, careful questioning, and the absence of the symptoms of intraperitoneal hemorrhage, should render the differentiation sure.

Attempted abortion gives evasive answers; rise of temperature; rapid, high-tension pulse; rigidity and tenderness over abdomen; not marked collapse.

Acute gonorrheal endometritis is accompanied by fever, there is pus in urethra; great tenderness over fundus of uterus; no marked collapse.

Rupture of a pregnant rudimentary horn in a bicornate uterus may present a history and symptoms impossible to distinguish from a ruptured tube, unless the tumor can be demonstrated to rise from the side of the uterus near the cervix, instead of at the fundus.

Rupture or perforation of stomach, appendix, or other abdominal viscus, when not traumatic, may closely simulate ectopic tubal rupture, but the patient is not usually so greatly collapsed; there is not the history of menstrual delay, and there is usually a record of symptoms pointing to the organ affected and a rapid onset of inflammatory symptoms.

Small tumors of the ovary or tube, with acutely-twisted pedicle, may at times produce symptoms and physical conditions extremely like a ruptured ectopic tube, and may be accompanied by irregular uterine hemorrhages. The tumor, however, nearly always has more mobility and an appreciable space between it and the uterus, the history is different, the symptoms do not develop so rapidly, and the collapse is not marked.

3. *Early, with Rupture, Extraperitoneal Bleeding, and Hematocele.*

The history is the same as in the preceding forms, but the signs of internal bleeding are less severe; there is severe pain, faintness, and nausea for a few hours; then a remission of the symptoms for a variable time, with sudden repetitions of the attack. With every bleeding there is pain, weakness and tenderness for several days. The patient becomes more and more weak and ill; she is confined to her bed; the abdomen becomes painful and tender; with the development of peritoneal inflammation pain with rigidity appears. There is increasing anemia. The pulse is quick (110-120) and feeble. There is a rise of temperature (101-102), due to blood resorption. Where the bleeding is extraperitoneal the stripping of the peritoneal coat from the rectum is liable to cause a septic (usually colon bacillus) infection, with higher temperature and the so-called typhoid symptoms.

On vaginal examination the clear outlines of the tube are lost in the hematocele. The uterus may be pushed to one side or forward. The mass of the hematocele is at first soft, but later becomes harder. It may be absorbed if small, but is apt to become infected and septic.

Hematocele is nearly always the result of a tubal abortion or tubal rupture, but may be caused by trauma or by the rupture of a vessel in the broad ligament.

Pelvis cellulitis or *peritonitis* is distinguished from hematocele by a history of infection, by a less sudden onset, by more continued fever, by greater hardness, by more marked sensitiveness, by the absence of the history or signs of internal hemorrhage. It is usually bilateral.

Pelvic abscess may result from the breaking down of an old ectopic mass or from sepsis from gonorrhea or other infection. The history would decide.

An old hematocele that has become hard may be mistaken for a *myoma* of the uterus, but the history and the absence of recent acute symptoms, and of the firm, rounded, nodular surface peculiar to the myoma, should make the diagnosis clear.

Malignant disease of the tube or broad ligament gives a different history, is of longer duration, and is very hard and irregular in contour.

Cornual pregnancy, or pregnancy in a rudimentary horn, is usually impossible to differentiate after rupture has occurred, unless we can feel the sulcus at the fundus or can determine that the round ligament lies on the outer side of the mass; it lying to the inner side in tubal pregnancy.

4. *Advanced, with Living Child.*

a. Tubo-abdominal.—We have here the ordinary signs, symptoms, and history of pregnancy, with, in addition, the history of pains, sickness, and irregular bleeding during the early months. The patient complains that the movements of the child cause her more distress than in former pregnancies.

On inspection and palpation, the movements of the child are seen and the fetal parts felt with curious and extraordinary distinctness. Careful and gentle palpation shows no contractile sac (uterus) around the fetus. This is a most important diagnostic point and must be carefully watched for. The placenta is attached below and to the side. Vaginal examination determines that the uterus is displaced to one side and forward, and is distinctly separated from the child.

b. Tubo-ligamentary.—In this form the conditions are more difficult to detect than in the tubo-abdominal, as all the signs are less strongly marked. The fetal parts and movements are less easily felt. It is often difficult to hear the fetal heart. Child is contained in sac, but you find no rhythmic contractions, as in uterine pregnancy. Placenta is apt to be above fetus, or at least higher than in the tubo-abdominal form. Hemorrhages into the sac are common. Per vaginam the uterus is felt pushed to one side and down. It is in much closer relation to the pregnancy than in the tubo-abdominal form, but can usually be recognized.

At term these patients have a more or less well-marked false labor. There are crampy pains, vaginal discharge, maybe expul-

sion of membranous shreds. After several hours or days, these symptoms cease suddenly. The breasts fill for a time. The signs of pregnancy disappear and the patient may go an indefinite time before septic symptoms develop. The condition is apt to be mistaken for a "false alarm" preceding a normal labor, but the finding of a small displaced cervix should lead to a thorough examination.

Normal pregnancy, with a thin uterine wall, so that the fetal parts are apparently just under the skin, sometimes occurs, and may be differentiated by feeling the contractions of the uterine wall over the fetus and by vaginal examination, showing that the pregnancy is in the uterus.

Pregnancy in a rudimentary horn may be disclosed by finding the unimpregnated horn pushed to one side, by noting the deep sulcus between the small uterine fundus and the pregnancy, by the mobility of the pregnancy, and by the uterine contractions about the fetal sac. A double uterus would be disclosed by finding the unimpregnated half pushed forward and to the side, and by a double cervical orifice or double vagina. Both of these conditions are easily overlooked unless we constantly keep in mind the possibility of their occurrence.

5. *Near or After Term, Child Dead.*

In the tuboabdominal form, a correct diagnosis is usually not difficult, even in the absence of fetal movement and heart sounds, but in the posterior ligamentary form the condition may become very obscure when several months have elapsed since the death of the fetus. There are no subjective or objective signs of pregnancy. The history is apt to be misleading, and to give no hint of a possible gestation. A careful investigation will, however, gradually make the situation clearer.

The condition is most apt to be mistaken for a *malignant ovarian tumor*, which it very closely resembles. An ectopic sac is apt to remain stationary in size or to shrink, while a tumor shows a slow, steady growth. If there is evidence of suppuration, the mass is apt to be ectopic. The condition may also be mistaken for *tubercular peritonitis* or *fibro-cyst of the uterus*, but a careful physical examination and review of the history should enable the diagnosis to be made.

THE INDICATIONS REQUIRING THE ABDOMINAL OPERATION.

Dr. C. C. BARROWS said that so far as he had been able to ascertain, there was a general consensus of opinion on the part of all obstetricians that whenever the fetus was alive, median laparotomy should be employed in operating upon cases of ectopic gestation. He hardly thought it worth while to enter into a discussion of methods of operation under these conditions because he believed that even the most ardent advocates of the vaginal route would be unwilling to incur the serious risks to mother and child dependent upon any attempts to reach by way of the vagina an ectopic fetal

cyst containing a living child. The enormous vascularity of the dense adhesions surrounding such sacs, the absolute uncertainty of the site of the placental attachment, and the difficulty of controlling the inevitable hemorrhage when these were encroached upon, together with the formidable risk to the child's life, practically precluded the selection of the vaginal in favor of the abdominal route in these cases. Such cases were extremely rare, and, indeed, abdominal pregnancy of any duration, according to most authorities, comprised not more than 8 per cent. of all cases. He believed one might safely say that almost all cases of ectopic gestation that came to the hands of the operator were in that period of fetal life that ranged between the eighth and twelfth week of pregnancy, about 90 per cent. of those cases being tubal pregnancies. So that in discussing methods of operative procedure one might, he thought, use as their text ruptured or unruptured tubal pregnancies between the eighth and twelfth weeks. A careful study of the best authorities showed an enormous preponderance in favor of the abdominal method. He said he was free to confess that after some experience with both routes of approach, he was quite satisfied that in his hands the prospects of the patient's recovery were far better when the abdominal method was chosen. The removal of an unruptured tubal pregnancy through a median abdominal incision presented no more difficulties than the removal of a pyosalpinx. One found them at times absolutely free from adhesions, and while there was a good deal of thickening and softening, with increased vascularity of the broad ligaments, he had been fortunate enough to make a diagnosis and secure the patient's consent to operation, and this was simple enough. But when the cyst had been partially or wholly ruptured, one found himself facing a very different proposition. There was no case that the abdominal surgeon had to deal with where promptness of action and celerity of operation would stand him in such good stead as it would here. Many of his patients seemed moribund, yet it was at times amazing to watch the rapidity with which they rallied after the hemorrhage had been checked and restoratives applied.

Dr. Barrows said that his operative experience in ectopic gestation was based upon seventy-nine cases, not including several others of old so-called pelvic hematocele operated upon *per vaginam*. Of these, two cases were operated upon by the vaginal route and seventy-seven by the median abdominal incision. In two of his cases he had the good fortune to open the abdomen almost immediately after rupture had taken place, when the arteries could be seen spurting vigorously. One of these cases was referred to him by Dr. Haynes, and the other by Dr. Eddy of New Rochelle. all preparations for the operation in each case having been made prior to the rupture. When one opened the abdomen in a case of ruptured ectopic gestation he would be impressed at once by what seemed to be the enormous quantity of blood in the peritoneal cavity. The cavity seemed to be actually distended with blood, and this in fluid form would actually spurt from the incision. In addi-

tion to this fluid blood he would find clots everywhere. The whole peritoneal cavity would be full of them, the intestines caught and entangled in them, and the omentum glued to every structure within reach. The next thing that would impress him was the softening and maceration of all the structure within the cavity. These clots must be removed with great care and the ligatures seated with unusual caution or much damage may be done.

In the two operations done through the vagina he found himself greatly embarrassed by these two conditions. The blood and clots from above constantly interfered with the field of operation, and he was absolutely in the dark as to the conditions in the upper and middle abdomen. These operations were done after an extensive experience with the vaginal route for other intraabdominal conditions.

He then returned to a technique to which he believed he should always adhere. The abdomen was opened rapidly by a median incision large enough to admit the hand if necessary. Practically no attempts were made at this time to sponge the blood out. The fingers were carried rapidly deep into the pelvis behind the broad ligament. The mass which one found there was brought quickly into the abdominal incision and the adnexa removed. This having been accomplished, such liquid blood as could be removed by dry mopping, and such clots as could easily be detached without injury or excessive handling of, was followed by the removal of the surrounding structures and the abdomen closed without drainage. In this way he completed the operation within a few minutes, and the whole field was under the surgeon's eye. This was an abdominal rather than a pelvic one, and he said he could handle the parts without undue tension and with much satisfaction to himself. In the seventy-nine cases on his records there had been no deaths, and convalescence had, as a rule, been satisfactory. In many of these cases he had noticed a decided rise of temperature, beginning within a few hours after operation, and continuing over several days, but without other unusual symptoms.

THE INDICATIONS REQUIRING THE VAGINAL OPERATION.

DR. J. RIDDLE GOFFE said that the conditions *requiring* vaginal section, *i.e.*, making it imperative, would be limited to old ectopic pregnancies in which one met with hematocele, and, perhaps, decomposing fetus. Under such circumstances frequently infection had already occurred, but whether infected or not, the indications demanded vaginal section. That, of course, limited the indications to those that exist in cases of pelvic abscess. Pelvic abscesses are better treated through the vagina than through the abdomen. In the two classes referred to by Dr. Barrows, first, where there was a living child, the indications called for abdominal incision; secondly, where the woman was *in extremis* from an active hemorrhage, the abdominal incision undoubtedly brought one more promptly in contact with the condition and enabled him to stop the hemorrhage with more celerity than if the vaginal route were

selected. These two conditions, then, would require the abdominal incision, but all other conditions could be better treated through the vaginal incision, and he made this statement in spite of the fact that he knew it would bring down upon him much criticism. He said he was not present to apologize for advocating the vaginal route of attack, but to aggressively assert its claims. He believed the vaginal to be the true route of attack, that it was safer, more logical, and more direct than the abdominal. Dr. Goffe had had experiences with both routes, and, in his hands, the vaginal was more satisfactory than the abdominal incision.

In dealing with ectopic gestation, so far as difficulty of procedure was concerned, it did not compare with operations for salpingitis with adhesions, and in dealing with the latter the vaginal incision is the routine procedure. In a tubal pregnancy with no adhesions and no sepsis, the parts being, as a rule, freely movable, the organs can be brought into sight in the vagina and the hemorrhage readily controlled. By vaginal section is not meant simply puncturing the cul-de-sac of Douglas. The work is done through the anterior vaginal fornix. In many instances the posterior vaginal incision is also used. Dr. Goffe then demonstrated his technique by means of charts and drawings. With his technique the operation by way of the vagina was a very simple and easy one. He said objections had been made to this method because of the likelihood of scar tissue formation and consequent difficult labors, and he reported instances to prove that this was not the case, and that labor following vaginal work was gone through with with ease and without special discomfort. The objections raised, that after vaginal section cicatricial tissue in the vagina interfered with delivery, he said was nonsense.

DR. H. N. VINEBURG, referring to Dr. Bandler's specimen, said that the case could be explained by the presence of peritonitis, a very difficult thing to make out, even with the abdomen open, at times. He spoke of a case of malignant growth of the ovary with rupture and profuse hemorrhage, the patient dying within forty-eight hours from peritonitis, and symptoms not unlike those in Dr. Bandler's case. There was no probability, in his opinion, of there being an acute yellow atrophy of the liver or any autointoxication of pregnancy. Dr. Vineberg doubted the probability of such an intoxication occurring so early in an extrauterine pregnancy and when all the symptoms were only of four days' duration and corresponded with the rupture of the ectopic tube.

With regard to the etiology of ectopic gestation, this was a very difficult thing to decide in the vast majority of the cases, and he did not think that anyone could safely assume the presence of any one factor in all of the cases. The theory that appealed to him and which was based upon a number of experiments was that of Lode, and was very suggestive. Lode showed by experiments that the ovum may become impregnated before it reaches the tubes and increase in size to such an extent that the lumen of the tube would be too small for it.

The question of differential diagnosis was a difficult one. It was interesting to state that perhaps 75 per cent. of the cases of ectopic gestation in the hospital were diagnosed by the house staff, and often they were sure of their diagnoses when he might be in doubt. Yet outside the hospital it was rather the exception to find correct diagnoses of this condition made. One misleading feature was the idea that amenorrhea was a prominent symptom of extrauterine pregnancy. In a fair per cent. of the cases there was no amenorrhea at all. The last menstruation might be perfectly normal. He had had several cases in which there was a ruptured extrauterine pregnancy 16 or 17 days after a perfectly normal menstruation. Particular stress should be laid upon the atypical hemorrhage and the severe pain; these two symptoms should lead one to at least suspect the condition being present. The presence of a mass will help in diagnosing. Palpation of itself will not tell one positively the existence of an extrauterine pregnancy. Anyone who says he can always diagnose an ectopic pregnancy by palpation is either ignorant or untruthful. It is a physical impossibility to distinguish by palpation the difference between an enlarged tube due to the products of early pregnancy and a dilated or a thickened tube due to a pyosalpinx. The presence of temperature was certainly of no aid. In a series of nine cases published two years ago, seven had temperatures ranging from 101 to 104. The leucocyte count was not of much value.

When one made a diagnosis of extrauterine pregnancy, as a rule one should operate, and through the *abdomen*. He had done much work through the vagina, and he expressed his preference for the abdominal route. In some cases, though, of hematocele, a better recovery would follow an incision through the vagina. In opening the abdomen, sometimes the intestines would be found closely adherent, or matted together by adhesions, with peritoneum highly injected, and here it would be better to empty the blood clots, etc., through the vaginal incision, rather than to attempt to separate the adhesions and work from above. He said it was not always such an easy matter with the abdomen open to find the tube that was the seat of hemorrhage.

He would advise, therefore, when the abdomen is full of blood and the palpating hand does not readily find the affected tube, to seize the fundus of the uterus with a volsellum and draw it up to the abdominal incision. In this way both adnexa can be readily inspected. A failure to do this recently cost the life of a patient in a prominent hospital in this city. The patient was admitted as a case of intraperitoneal hemorrhage, presumably due to rupture of a gastric or duodenal ulcer. The general surgeon, on opening the abdomen, found it filled with blood. He examined the stomach and duodenum, and found no evidence of any ulcer or any bleeding point. He palpated the pelvic organs, and not finding any enlargement of either tube, he concluded the bleeding came from an unknown cause and closed the abdomen. The patient died several hours later. At the autopsy it was ascertained that the bleed-

ing came from a tubal pregnancy, the tube not being larger than a small finger, and the rupture had taken place near the uterine insertion.

In the interest of conservatism he believed that one should operate so soon as the diagnosis was made. If the condition was allowed to go on, the other tube and ovary usually became involved, as well, and would have to be sacrificed. He had seen several cases at varying periods subsequent to the rupture of the tube or to tubal abortion, which were very instructive in this regard, showing the different stages of secondary involvement of the adnexa on the opposite sides.

DR. BOLDT said that so far as the etiology was concerned, his own observation, covering about 150 cases of ectopic gestation, showed that in the majority of the cases there was some inflammatory condition of the Fallopian tube as an etiological factor, and this should be borne in mind. He had had instances of repeated ectopic gestation; at the time of first operation he had found the other tube—the one not involved by pregnancy—to be the seat of inflammation, which suggested to him at the time that this other tube might become the seat of an ectopic pregnancy at some future time. And this had really occurred in several instances. Therefore, in doing an operation for ectopic gestation, if one saw the other tube the seat of inflammation, he thought that the operator should not be adversely criticised if he also removed it, although he himself did not follow this course.

DR. JOSEPH BRETTAUER said that the choice of the vaginal or the abdominal route of attack in cases of ectopic gestation was a matter of preference and experience. He believed that one was as easy as the other, if one knew how to do it. There were some cases, however, in which the patient's life was risked by insisting on operating from below; and, again, lives may be risked by insisting upon operating from above.

The more cases of ectopic gestation that he saw, the more was he convinced that a good many needed no operation at all. By the time one operated in cases of ruptured ectopic gestation one often found that there was no actual hemorrhage and that the ovum had been expressed from the tube and that the patient was actually on the road to recovery. An attempt to make a diagnosis of this condition should be made, and careful observation of the history of the patient, and one should wait for some time before placing the patient on the table; by so doing, he believed that some of these cases would be excluded from operation.

DR. JOHN O. POLAK of Brooklyn said that excluding cases was very interesting, but how was one going to tell just what was going on, and how the case was going to behave? There were many cases of primary rupture followed by secondary rupture. The primary ruptures caused practically but little trouble, possibly some faintness, some pain, and the condition was often unrecognized. Then occurred the secondary rupture. He believed that the patient was offered better chances if one held to the principle

offered by Dr. Barrows, "when a diagnosis of ruptured ectopic gestation has been made, operate." He reported a case where a woman became pregnant with all the usual signs of pregnancy, but with exaggerated nausea and vomiting, a condition often seen in ectopic gestation. This patient had so much hyperemesis that the attending physician induced abortion and delivered her of a two and a half months' fetus. Eleven days after, she was seized with extreme pain and then went into a state of collapse. She rallied under stimulation, rest, and opium. She developed abdominal symptoms which were thought to be peritonitic, and she was sent to the hospital, where Dr. Polak saw her. He took the ground that he was dealing with a case of pelvic peritonitis, the result of meddling. A posterior vaginal section was made and instead of finding pus he found blood. The abdomen was opened and a three months' ruptured ectopic gestation was found, with the baby free in the peritoneal cavity with the cord running through the rupture. Here was a case of coincident extra- and intrauterine pregnancy with no close relation. One year ago he saw a case of ruptured ectopic gestation, both tubes rupturing within twenty-four hours of each other.

Dr. Bandler said the etiology of ectopic gestation was logically and practically known, notwithstanding what was said to the contrary. He had made a number of serial sections of inflamed and ectopic tubes, and he wondered that this condition did not occur more often. The etiology of ectopic gestation was very closely connected with instances of salpingitis. The only way that the ovum in the tube could be passed on was by means of the active ciliated epithelium. Anyone who looked at tubes, and closely studied the abnormalities found there, could readily understand why ectopic gestation should so often occur, and the wonder was that it did not occur more often. Among twenty-five ectopic gestations examined by Opitz, there was not one that did not show signs of inflammation. If not recognized macroscopically, they could be, as a rule, recognized microscopically. He emphasized the fact that the ciliated epithelium at the outer end of the tube must be normal for the transference of the ovum to the point where ectopic embedding takes place.

Dr. BROOKS H. WELLS said a speaker had raised the question of the manner of the hemorrhage in early tubal pregnancy. When the ovum became implanted in the tube, the villi of the chorion grew into the tube walls in all directions, much as the roots of a tree grow into the soil. The protoplasmic masses of the syncytium and the cells of the chorionic ectoderm or trophoblast eroded or absorbed the tubal elements with which they were in contact, so that many villi probably by the seventh to tenth week had grown completely through the tube wall, the tube in consequence becoming very friable and easily torn or ruptured by bleeding into its own structure. He had operated in several cases where there was blood in the peritoneal cavity in considerable amount, but where there was no macroscopic evidence of rupture, and in

one case, after the tube *in situ* had been gently sponged dry, had watched the oozing or sweating of blood from the apparently intact peritoneum covering the gravid area.

He did not believe in removing the remaining tube unless it showed changes that would justify its removal aside from the fact of the ectopic pregnancy. He had removed ectopic pregnancies from three women who had since borne living children, and so far as he knew only one of his operative cases had suffered a second ectopic pregnancy.

Abdominal section was indicated in practically every case where the diagnosis of ectopic gestation was made, or where there was strong presumptive evidences of such a condition existing. Operation should not be done if an absolute diagnosis could be made of tubal abortion. But that could rarely be certain, and it was dangerous to wait; therefore he believed it to be far better to operate at once and see what was there. Fortunately the conditions likely to be mistaken for ectopic pregnancy were conditions for which abdominal section was indicated. The greatest danger was in overlooking the conditions.

TRANSACTIONS OF THE CHICAGO GYNECOLOGICAL SOCIETY.

Meeting of September 15, 1905.

The President, J. CLARENCE WEBSTER, M.D., in the Chair.

DR. JUNIUS C. HOAG read a paper on

INJURIES TO THE CHILD INFLICTED AT BIRTH.*

DR. JOSEPH B. DE LEE.—During the reading of the paper it occurred to me that perhaps I might add something to it in regard to deliberate birth injuries. It often happens in the course of delivery of children where there is a contracted pelvis that from this or from that error of attitude the delivery is impossible, or impossible fast enough that the child may be saved. The delivery is impossible more often on account of the mechanical disproportion exhibited. In such a case it may be advisable for the obstetrician deliberately to produce an injury to the child in order to facilitate its delivery. Such injuries in my own experience have been, first, a fracture of the humerus; second, several fractures of the clavicle; third, four cases of attempted fracture of the skull.

The first case of fracture of the humerus was a patient in the Chicago Lying-in Hospital dispensary service several years ago, a woman with a generally contracted pelvis who had had a craniotomy in her only previous labor. The head was delivered after a difficult forceps operation, showing at once a very large child,

*See original article, page 50.

and the shoulders lodged firmly across the inlet. It was impossible by ordinary means to bring the shoulders into the pelvis, and a hand passed up discovered that the arm lay across the pelvis under the right side of the child. After an ordinary amount of time had been consumed, and various attempts at delivery had been made, combined with external pressure, aided of course by traction from below, I found it impossible to deliver the child, and therefore deliberately broke the humerus. The rest of the delivery was easy. The arm placed in a splint recovered. The child had a brachial plexus involvement from a large callous, which lasted a year and a half, and now has practically disappeared.

Subsequently I found it necessary to fracture several clavicles in order to successfully deliver arms that were drawn up above the head in breech presentations, or lay across the pelvis. But what I particularly wanted to mention was deliberate fracture of the skull as a means of delivery in contracted pelvis. I may say that I would not mention this in any society except one of specialists for obstetrics and gynecology, because for general practice the method is not to be recommended. The first case in which I did this unique operation was a flat rachitic pelvis, through which, about a year and a half previously, I had delivered alive a five-pound child. This second child was probably a half-pound larger, and the head was caught above the inlet. Finding ordinary methods of delivery unavailing I deliberately fractured the skull by pressure from above. I tried to replace the indented bone by pressure, but did not succeed. However, the infant survived and is alive to-day. That young woman was delivered a year and a half later of a child weighing half a pound more, and again I deliberately fractured the skull, as the head caught on the inlet and would not come through. Those two children I exhibited before the Chicago Medical Society some two years ago.

The third case was a flat rachitic pelvis, in which the first delivery was a craniotomy; the second, a premature one, induced by myself at eight months. A seven-pound child was delivered spontaneously, but died twenty-four hours later. In the third delivery the head was caught in the inlet, and after the usual methods of extraction failed I tried to fracture the skull, but did not succeed. The child succumbed and craniotomy was necessary.

The fourth case was a woman who had a uterus arcuatus, who had had five previous breech presentations, in which the children were delivered after two or three hours' traction on the after-coming head, all dead, of course. She came to Chicago from a small town in Illinois. I found a conjugate vera of seven, and a slight uterus arcuatus present. I advised Cesarean section, but she refused either that or symphysiotomy. Labor took place at term. The child, weighing seven and three-fourths pounds, came down to the head, and would not pass the inlet. I put my finger over the promontory and from the outside pressed the head against

the finger, the bone cracked and I delivered the child very quickly. Immediately after delivery I squeezed the baby's head in the opposite direction, and the bone snapped out with an audible click. The child had a hematoma over the area of depression, but had no cerebral symptoms, grew fat at the breast, and was discharged after three weeks, in fine condition.

The reason the operation did not succeed in the third case was that the head was too hard. In the other cases the head was soft and it was possible to indent the skull.

This brings me to discuss the relative dangers of such operations, both to the mother and the baby, as compared with Cesarean section, and to a certain degree with symphysiotomy and pubiotomy. I believe that nearly all obstetricians as they get further along in practice will take less and less joy in the performance of these brilliant grand stand deliveries, such as those just detailed. For example, in a difficult version followed by difficult extraction with delay in bringing down the arms, and with Herculean efforts to bring the head through a contracted pelvis, while often producing a living child, experience shows that these children, if they do not die within the first ten days after delivery, do die subsequently, or are injured for life. It has been impossible to watch all the children delivered in this way grow up, but some have been followed, and in one was found hydrocephalus with partial idiocy; in one there were epileptic seizures, in another cranial deformity, and in one of the two mentioned, Erb's paralysis, with subsequent inability to use the right arm. Most of these injuries occurred during delivery through a contracted pelvis. And the women did not all escape "scot free." There was rupture of the perineum, cervix, and of the lower part of the uterus, with subsequent scar formation and danger of rupture during delivery in future labors. One woman had a double phlegmasia alba dolens, from which she successfully recovered, but retained occasional edema of the legs and incomplete ability to carry out her housewifely duties. All these things and many more make me think that later on, when the Cesarean operation shall have become still more successful, we will adopt abdominal delivery more often where vaginal delivery is impracticable or too dangerous.

Another point the paper suggested was the question of wryneck. One of the first bad experiences I had in private practice was with the child of a nurse that I delivered in the left-occipito-posterior position, with forceps. It was a difficult forceps delivery, and the child developed wryneck. It was sent to a surgeon who was not much of an obstetrician and had not read up on wryneck from an obstetrical point of view. He said the condition was due to an injury received during delivery, and that the obstetrician was to blame. I looked up the subject and found that he was not absolutely justified. Pincus, in the *Zeitsch. für Geb. und Gyn.*, in 1896, published a very exhaustive paper on wryneck, and found that in most cases it was a congenital shortening of the muscle.

I made some experiments of my own. I sat up the newly born baby and twisted the head in the horizontal axis; I twisted it under traction and under flexion, and found I could, without even making the child cry, rotate the head from 180 to 220 degrees, and without doing permanent or even temporary injury. Therefore hyperrotation of the head will not rupture or injure the sterno-cleido-mastoid muscle. Subsequently I had in my own practice, and saw in consultation, in the service of the internes of the Chicago Lying-in Hospital and other hospitals, relatively numerous injuries of the sternocleidomastoid, with hematoma, in which no wry-neck was developed. I saw several cases of wryneck after perfectly normal deliveries, and in examining a child I not unfrequently saw a congenital shortening of the sterno-cleido-mastoid, that was evident as the infant lay in its crib. Not long afterwards I found a child with congenital shortening of the leg muscles, so that it was almost impossible to extend the legs. Investigation showed that this child lay in the uterus with hardly any liquor amnii for several weeks. I examined several children of breech presentations and found the anterior sternocleidomastoid shortened. In a primipara the posterior muscle is shortened, which is explained by the child being held firmly against the spine by the tense abdominal wall. In multiparæ the anterior muscle is shortened because the lax abdominal wall allows the uterus to fall forward. I believe that in labor direct injury to this muscle is hard to produce except by brutal force; that in most cases of wryneck the muscle was originally shorter and the labor either stretched or tore it. I noticed that hematoma in the sternocleidomastoid did not produce wryneck, but that a subsequent myositis did. I have intended to study this branch of the subject further, but have not been able to do so.

The three points I wished to bring out in the discussion were, first, direct deliberate injuries to the child to facilitate delivery; second, the fact that the necessary injuries in contracted pelvis would often sway our judgment in favor of Cesarean section; third, the occurrence of muscular contractures during pregnancy which are the basis underlying certain injuries during birth.

DR. GEORGE SCHMAUCH.—A hematoma might in rare instances trespass the sutures. In those cases we can always make the diagnosis of premature synostosis. I have seen a couple of such cases of staphocephalus trigonocephalus, as they are called. The treatment of hematoma is very important. I always wait for ten days before performing puncture in order to give the blood vessels time to close. Depressions of the frontal part of the head are nearly always caused by forceps, whereas those of the parietal bones are generally the consequence of a contracted pelvis. As Dr. De Lee remarked, we are able to adjust such a depression right after labor by simply taking the head in the hands and exerting pressure. I also have tried it with success in one case, but if there is real fracture we will have no success.

Rupture of the cord is, I think, a very rare accident. I have only once seen the breaking of the umbilical cord. In this case the doctor, after the child was born by a forceps delivery, attempted to sit down, but some one had taken away the chair and he sat down on the floor, bringing strong pressure to bear on the cord and breaking it.

In regard to Dr. De Lee's remarks, I would say that the deliberate fracture of the skull, even mentioned in a society of specialists, sounds queer, to me, at least. I have fractured humeri deliberately, but never the skull. I certainly cannot help it sometimes.

DR. DE LEE.—If you had a case of breech extraction would you let the baby die and do craniotomy, or would you deliberately fracture the skull?

DR. SCHMAUCH.—I would not try to do it, but sometimes we cannot help it. We misjudge the proportion between head and pelvic inlet. The only deliberate fracture I make sometimes is a fracture of the humerus. Where you cannot free the arm lying around the neck and the child is suffocating you have to break the humerus. But thereby the life of the child is saved, whereas a fracture of the skull injures the brain, and usually destroys life.

Injuries such as depressions are not usually of fatal consequence.

I have seen two children of a woman with a flat pelvis, and both had a spoon-shaped depression upon the same parietal bone; Strassmann has reported a family, in which five children had these depressions. Some of the children showed a loss of hair at the place of the depression, but mentally they were not affected.

DR. RUDOLPH W. HOLMES.—The discussion has perhaps gone a little afield from the title of the paper—certain intentional injuries have not been mentioned which seem appropriate in this connection. Phenomenoff introduced a very important operation under the category of embryotomy, cleidotomy, which has been recommended by Bonnaire as a step in the delivery of the living child when the shoulder girdle causes an interference with its birth. On theoretic grounds Bonnaire maintains that the operation may be only a little more serious than a subcutaneous fracture of the clavicle.

There is another point that I think ought to be mentioned, and that is the suggestion of Dr. Stowe of Chicago to do a tracheotomy on a child whose head (in breech cases) has been delayed at the brim; by this procedure the respirations may become established, giving the head time to mould, and then delivery may be consummated.

About the cranial spoon-shaped depressions of the newborn. In most instances it is a great mistake to do any manipulation, much less to attempt any surgical maneuver with the idea of raising the depression—in most instances the bones will return to normal from the intracranial pressure; a failure of spontaneous cor-

rection is largely limited to those heads in which there is an abnormal degree of ossification. My first cranial depression occurred shortly after I began practice. I at once consulted a well-known surgeon, who advised bringing the child to the hospital for an immediate operation. The mother refused to permit the child to be taken away—in a few days, or two weeks, the depression righted itself. About six months ago I delivered a little woman with forceps; she had a contracted pelvis, with lordosis and scoliosis; unfortunately, she almost died on the table from the anesthesia. In the emergency the living baby was literally pulled out. As the head was born a deep parietal bone depression was noted. As the infant was passed to the nurse I saw the bone snap back into its normal contour. This is but an exaggerated example of what will occur in many of these injuries of birth.

The surprising thing in obstetrics is that more children are not injured in spontaneous deliveries, and it is truly remarkable that more babies are not injured during operative extractions by both skilled and unskilled operators.

DR. C. B. REED.—I would like to refer for a moment to the subject of the separation of the epiphysis of the humerus.

The method advocated by Dr. Hoag, which brings the arm across the front of the chest, is unphysiological, and will rarely secure a good result.

The second method described by the essayist will secure a correct result, yet the traumatism is unnecessarily increased.

As the doctor states, the epiphysis in such an injury is rotated outward, while the arm rotates inward.

Now the physiological method of correcting such a deformity and approximating the disunited surfaces is to elevate the arm to the height of the shoulder, and in a straight line with the neck and acromion process, and then rotate the arm outward (or backward) and hold it in position by a plaster dressing.

The humerus is now in apposition with the epiphysis and unites in the usual time and results in a functionally good arm.

This is the method of Kocher, and has given excellent results.

DR. HOAG, in closing the discussion, said: I was led to look up this subject on account of certain cases occurring in my own practice, particularly the cases of Erb's palsy, which I reported in the paper read this evening.

In going over the literature of Erb's palsy I was surprised to find a great diversity of opinion regarding the trauma involved which, in my cases, appeared to me to be due to traction brought to bear upon the brachial plexus in the endeavor made to release the shoulders. Erb's palsy is a disease of such great importance as to deserve our most careful attention to its mode of production and to its prevention. The books teach that when marked improvement does not take place within three months the prognosis is to be regarded as grave.

It seems to be the opinion of most general practitioners who are

concerned with obstetrics that there are not many injuries occurring to children during parturition. They simply ascribe the deaths and injuries which occur in their practice to some trouble that could not be avoided, and make very little inquiry into the etiology of their cases.

I have seen children born after easy labor when everything apparently was perfectly normal and yet death ensued in a short time, and I apprehend that in a certain number of these cases there was a cranial hemorrhage, notwithstanding the ease of delivery. I was surprised to find the statement of Cruvelhier that such a large percentage of cases of stillbirth is due to this cause. If the statement is correct it is remarkable that these hemorrhages can occur with so little apparent cause for traumatism.

With regard to Dr. De Lee's cases, I can not conceive of any circumstance under which I would be willing to deliberately produce a fracture of the skull, and fortunately, as Dr. De Lee suggests, the technique of Cesarean section has been so greatly improved that we need scarcely consider such as expedient. I recently performed a Cesarean section for relative indications, there being no great amount of pelvic contraction, the operation being done because labor would not come on, and the patient was in a very exhausted condition. She had wasted away until her net weight was only 66 pounds. I felt confident that Cesarean section offered the patient the very best chance of recovery, and the results certainly justified the operation, an excellent recovery taking place.

RUDOLPH W. HOLMES, M.D., Editor of the Society.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Cesarean Section in the Death Agony and Post Mortem in Women Suffering from Heart Failure.—Busalla (*Zent. für Gyn.*, Sept. 23, 1905) details the case of a woman with heart failure, seemingly about to die, in whom a living child was delivered by Cesarean section, the mother dying suddenly four days afterward. The indications for the section in such cases were stated by von Roser to be these: When the physician believes that the mother cannot live more than twelve hours; when life is so far gone that there is complete unconsciousness; when delivery by natural means is impossible, after ascertaining by auscultation that the child is living, a section should be done. The difficulty is to make the prognosis that the mother cannot live more than twelve hours. The author cites cases in which this was thought to be the case, in which after the section the mother recovered. Faszit gives it as his opinion that it is impossible to be certain of such a prognosis. The author thinks that we should be able to feel movements of the fetus as well as hear the heart sounds.

When the heart is so slow or quickened that danger to the life of the child is imminent the indication is to deliver as rapidly as possible. In eclampsia symptoms that threaten death for the mother frequently end in recovery. Hence in this condition it is difficult to make an exact prognosis of the length of the mother's life, and therefore difficult to determine whether Roser's indication for section is fulfilled.

Permanent Enlargement of the Pelvis by Hebotomy, with Reports of Two Cases.—Ettore Truzzi (*Ann. di Ostet. e Gin.*, Sept., 1905) discusses the probability of obtaining a permanent increase in the pelvic diameters after hebotomy, such as is obtained by symphyseotomy. Van der Valde has reported ten cases, with excellent results, in some of which such enlargement has occurred. In one of these cases the increase in the size of the pelvis was shown both by pelvic measurements and by radiography, and it was evident to the eye that the symphysis was not exactly in the middle, as was shown by the location of the clitoris and urethra to one side of the median line. In order to secure such enlargement it is important to prevent the interposition of the soft parts between the surfaces of the cut bones, so that a firm callus will form to give support to the superimposed weight of the body. Van der Velde advises giving no surgical support to the pelvis during the process of healing, but allowing the parts to remain somewhat separated, trusting to nature to fill up the gap. The author suggests that we should experiment with placing between the bony surfaces a partly decalcified plate of bone, so as to maintain a larger amount of separation than would naturally occur. He believes that it is quite as important for future delivery to secure an increased transverse, as an increased anteroposterior diameter. Both cases operated on by him at the Hospital of Padua were successful in delivering a living child, and both mothers were discharged with solidly united pelvic bones.

Anencephalous Monsters.—Nicolas Alex. Petzalis and George Cosmettos (*Ann. de Gyn. et d'Obst.*, Oct., 1905) after giving the anatomical and microscopical examination of the nervous system of an anencephalous monster observed by them, enter into the discussion of the causes and development of these deformities. The case observed by them presented an entire absence of brain, and a partially developed spinal cord, with a canal of abnormal size. There were some groups of ganglion cells representing the anterior and posterior horns of gray matter, with a small amount of white matter surrounding them. The size of the central cavities of the spinal cord was attributed to an intrauterine hydromyelia, which produced dilatation and compression of the nervous matter surrounding it. The best developed cords of white matter were the posterior columns. The bulb was rudimentary, so that only a part of the cranial nerves could be recognized. Most investigators have found these monsters to have similar lesions. The posterior columns are usually

well developed; the anterolateral are absent. The columns of Clark, which are in relation with the cerebellum, are undeveloped. Experiments have shown that we may develop monsters by making use of the methods of nature: *i. e.*, by modifying the surroundings by pressure, temperature, light, or by poisons and disturbances of nutrition, elimination and disassimilation. The laws for the use of these measures are not yet known. The causes, according to Dareste, are accidental conditions, such as modify the organism while it is in production, giving a different direction to the phenomena of evolution. During the embryonic period chemical and mechanical agencies produce deformity, while during the fetal period they destroy the life of the fetus. The pathology of these deformities is referred either to a primitive disease of the neurons, or to an intrauterine meningitis. The formation of the posterior and lateral columns is not consistent with the first theory. The authors conclude that the dilatation of the medullary canal is due to hydrocephalus, a result of inflammation of the meninges and ependyma in embryonal life. The essential organs of life develop separately, so that some may be present while others are undeveloped. Hence they go on developing in the absence of a properly developed nervous system.

Pyonephrosis, Pyelitis and Compression of the Ureter During Pregnancy.—Albert Sippel (*Zent. für Gyn.*, Sept. 16, 1905) shows, by reference to a case, how the growth of the uterus can compress the ureter so as to produce abscess of the pelvis of the kidney and pyonephrosis. He believes that, in his case, the compression was due to the development of the uterus, not to the weight of the child, as the kidney complications occurred in the sixth month of pregnancy. The troubles came on in the midst of an otherwise normal pregnancy, with fever, and pain in the back, no changes being found in the urine by chemical or microscopical examination. This was due to the fact that the ureter was compressed and the urine from the left kidney did not reach the bladder at all. A fluctuating tumor in the region of the kidney soon appeared, and a supposed abscess outside the capsule was opened, to find that it was limited by the capsule of the kidney, with compression of the left ureter. The patient remained in bed, and was directed to lie on the right side, so as to relieve the pressure on the ureter. This treatment was successful, and the urine from the left kidney appeared again in the bladder, containing pus in an acid medium. A normal labor took place at term, and the kidney abscess was healed and the patient was discharged, after a normal puerperium, with only a few pus cells in the urine. The left kidney is more easily compressed than the right. The compression, together with a bacterial infection, is the cause of the pyelitis, which is due usually to the bacterium coli. The fever is analogous to catheter fever, from resorption of the urinary constituents. In a case in which the condition was allowed to go to

the end of pregnancy the ureter became impermeable, and it was necessary to remove the kidney after labor had taken place. Cases of pyelitis also occur, during pregnancy, that are not due to compression of the ureter, and in these cases the position on the right side has no effect on the symptoms. Had the ureter in this case not become permeable it would have been necessary to induce premature labor. When compression is not present the diagnosis can be made by the composition of the urine, the presence of pus in an acid medium, flecks of mucopus and a large amount of albumin. For cystoscopy in such cases the knee-elbow position is useless, because the pregnant uterus presses the bladder against the trigonum, and a view of the bladder cannot be obtained. Compression of the ureter in pregnancy is not frequently reported; either it is rare or it is not recognized.

Treatment of Intraperitoneal Hemorrhage After Ruptured Tubal Pregnancy.—H. Futh (*Zent. für Gyn.*, Oct. 28, 1905) says that the operative procedures of surgeons in ruptured tubal pregnancy are of three kinds. One group believes that all the blood should be left in the pelvis to be reabsorbed, thus lessening the anemia, which is one of the most serious symptoms of the condition. Another group removes all the blood carefully by washing and sponging the organs, lest the bloodclots become infected. The majority of operators hold a middle course, removing the larger portion of the blood, but allowing what cannot be easily reached to remain, so as not to prolong the shock of the operation. They admit that there is a possibility of infection, but contend that the general condition of the patient will not permit of its removal. The author gives the results of such operations in the Frauen-Klinik at Leipzig: There were 21 cases, with two deaths, one from extreme anemia due to bleeding of the stump after operation, the other from peritonitis, due to infection of the laparotomy wound in a ruptured tubal abscess. Four died in transport and before operation. Fourteen were cured, and none died of anemia, although several were exsanguinated on arrival. All of these cases had all possible blood removed at the time of operation, after the method of Zweifel. Of Werth's 42 cases, 12 died; five of anemia, one of septic peritonitis, one of kidney disease, the last of bleeding from torn adhesions. In these cases some blood was left in the abdomen. Kauffer, in Wert's Clinic, removes all blood possible. There were 35 cases, with seven deaths, five from anemia. From Olshausen's Clinic are reports of 90 cases. Thirteen died, of whom six were exsanguinated before operation; one died of septic peritonitis; three of further bleeding, three of peritonitis, one of ileus. In most of these cases considerable blood was left behind. The middle course of removing the coagula alone is taken by Gusserow and Runge. Of 42 operations 11 died: two of anemia; three of sepsis. Hermes gives 54 cases: 11 died; three of anemia; one of aortic stenosis;

three of infection; one of ileus, one of embolism of the lungs, one from narcosis, two from peritonitis. In these cases most of the blood was removed. Objections to the removal of all blood are made by Flatau as follows: It is impossible to remove all blood. Such treatment is an insult to the peritoneum; the removal of all blood prolongs the operation; rapid operation, asepsis and good assistance make it possible to have good results under his method. Zweifel leaves salt solution in the abdomen to counteract the anemia. According to his observations, in cases examined post mortem, there were no traces of the blood to be found, all having been absorbed. The author contends that two series of operations by Werth and those in Zweifel's clinic, without any deaths from anemia, go to show that Zweifel's method is the best. The figures of Ohlshausen, Gusserow and Hermes opposed to those of Werth and Zweifel are still too scanty to decide so important a point.

Hyperemesis Gravidarum.—Dirmoser (*Zent. für Gyn.*, Sept. 30, 1905) describes observations made by him on twenty cases of vomiting of pregnancy, from which he advanced the theory of autointoxication. He has recently observed a case of eclampsia with pernicious vomiting. It occurred not at the end of pregnancy, but at the close of the third month, and there was only a small amount of albumin in the urine. He believes that there was a relation between the pernicious vomiting and the eclampsia. The poison produced by the hyperemesis caused the eclamptic seizures. Possibly this poison was acetone, which was found in considerable amount in the urine of this patient. The cause of the toxin production is believed to be not the fetus, but the increased amount of work falling upon the gastrointestinal tract. The growing fetus, through a reflex effect on the secretory function of the vagus nerve, influences the metabolism of the mother, and the intermediate products of the transformation of albumin are thrown into the circulation instead of being excreted by the kidney. This theory is supported by the finding of indoxyl, skatol, acetone and acetic acid in the urine and the increase of urobilin, peptone, etc. Eclampsia is due to an increase of ammonia compounds, the sign of a failing liver action. The liver, instead of transforming the products of albumin into such as are eliminated by the kidneys, throws them into the circulation. Among these are a number of ammonia compounds, leucin, glycocoll, etc., which are regarded by Zangenmeister as a cause of eclampsia. Others believe the cause of the poisoning to be rather the lack of digestive power of the intestine than the failure of the liver.

Investigations into the Causes of Eclampsia.—Zweifel (*Archiv. f. Gyn.*, Bd. 76, H. 3) has made chemical examinations of the nitrogenous combination in the urine of eclamptic women and compared the results with the same substances from normal kidneys. As a result he states that there seems to be no doubt that in eclampsia there is an increase of ammonia salts in the

urine, which indicate an abnormal amount of acid in the blood. There is a reduction of the fully oxidized sulphates and an increase of the less oxidized sulphur compounds. From 42 examinations of eclamptic urine he draws the conclusion that there is a great reduction of oxidation of albumin in the body. The author also tested for lactic acid in the urine of eclampsia, with the result that he found it in many cases of this complication. The presence of lactic acid in the urine of men and mammals is always pathological. It appears in various forms of poisoning, such as with curara, strychnia, morphine, amylnitrate, arsenic, phosphorus, etc., as well as in epilepsy and eclampsia. It arises from lessened oxidation and the taking up of acid by the blood corpuscles. The practical considerations that result from these investigations are given thus: Prophylactic measures for the prevention of this suboxidation in pregnancy are of the greatest value. The examination of the urine should be made every two weeks in all cases of pregnancy. As soon as albumin is found, the patient should be put upon a vegetable diet, albumin except in the form of milk, being prohibited. When eclampsia has come on all the measures we can use are of little avail. Labor should be induced as soon as convulsions set in, the cervix being artificially dilated as rapidly as possible. For this purpose he uses metallic dilators, and when necessary incision of the cervix uteri. When the cervix is not dilatable he uses vaginal Cesarean section with patients who are in the hospital, in private houses abdominal Cesarean section. The life of the child is generally not endangered by the poisoning of the blood, but only by asphyxia of the mother; hence the life of the child should be preserved whenever possible, and perforation is in order only when the child is known to be dead. Morphine only adds to the poisoning. Operations should be done under chloroform. Venesection and saline infusions are of use, and oxygen may be given, aided by electric stimulation of the vagus. Squills and digitalis are also of use.

GYNECOLOGY AND ABDOMINAL SURGERY.

Paralysis of the Unimpregnated Uterus.—R. Kossmann (*Zent. für Gyn.*, Oct. 14, 1905) describes an elongation of the lumen of the unimpregnated uterus of more than two centimeters as not a true paralysis. This occurs during curettage in many cases. The author believes that a true paralysis is very infrequent, while a temporary relaxation of the uterus, after allowing air or fluid to be forced into the lumen, is much more frequent. In other cases there remain in the uterus small remnants of a partial abortion, which constitute a continuation of the pregnant state. It may also result from the use of a laminaria tent for a long period, the uterus becoming gradually relaxed and not responding easily to stimuli. This relaxation, according to Van Tussenbroeck, renders it very easy to perforate the uterus with the curette, and constitutes a serious danger, owing to the thinness

of the wall of the relaxed uterus. There is also increased danger of infection, as well as increased pain. The author believes that dilatation preceding curettage can be secured by the use of uterine sounds or curettes of various sizes, and that laminaria tents are quite unnecessary. In ninety-nine cases out of one hundred no other form of dilatation is needed. Relaxation after the use of sounds is so transient that it is not a danger in itself.

Robert Asch (*Zent. für Gyn.*, Oct. 14) states that relaxation of the uterus is only temporary, and that a suitable stimulus will provoke a strong reaction of contraction soon after the relaxation. In most cases there is a temporary arrest of sensation. This is due to the use of anesthetics, which the author believes to be unnecessary for a mere curettage. In deep narcosis the sensation of the uterus is held in abeyance, so that a stimulus from the curette has no effect on producing a contraction. When curettage is done without narcosis, if relaxation occurs the operator has only to sweep the curette two or three times across the wall near the cervix in order to produce a strong contraction of the uterine muscle. He believes that the use of laminaria tents for dilatation in these cases is a bad practice. Rapid dilatation with metallic sounds is a much better method.

The Vascular Anatomy and Physiology of the Human Uterus.—M. Keiffer (*Bull. de la Soc. d'Obst. de Paris*, June and July, 1905) has made extensive studies of the microscopic texture of the uterus and the distribution of its arteries in the parenchyma of the organ, their relation to the muscle, and especially the distribution of the capillary circulation. He made vascular injections with carmine gelatine in animals and in specimens immediately after their removal from the human body for disease of the adnexa. The uterus is supplied by the uterine artery, which also supplies the internal half of the tube, the ovary and upper part of the vagina, bladder, etc. The internal and external spermatics supply the external portion of the tube and ovary. The circulation of the uterus is highly developed, and exceedingly complicated on account of the irregular terminal system involved. Each artery runs a course in the parenchyma, for the most part in a spiral direction. It is surrounded by loose connective tissue, which separates it from the uterine tissue, but is continuous with the framework of the organ. After branching, the artery becomes smaller and the connective tissue sheath diminishes in thickness, until it disappears and the arterioles are in direct contact with the uterine muscle. At last the muscular elements are entirely lost and the arteriole is represented by an endothelial covering in contact with the parenchyma, forming the capillaries. The capillary circulation is of the nature of fissures, very capricious and irregular, presenting considerable circulatory surface lined with endothelium, and in direct contact with the muscular and connective tissue elements of the parenchyma. The veins are irregular in form,

flattened, with thick walls, little contractile, parallel with the arteries. The muscular tissue of the veins is continuous with that of the uterine parenchyma. The uterus is an organ at once muscular and elastic, destined to undergo modifications at the menstrual periods and in pregnancy, consisting of much dilatation and a subsequent regression. During its periods of activity the uterus has a dynamic power consisting of muscular peristalsis. The spiral form of the arteries is of value in these changes of volume. The arteries by their loose connective tissue covering maintain a functional independence; their walls contract freely and carry on the arterial wave into the muscular masses. The uterus should be considered as an expansion, a colossal local hypertrophy of the vascular system in that it reacts like an ordinary artery to vasomotor influences. The organ reacts promptly under an excitation of peripheral or central nervous origin, and the organ contracts as promptly as does the heart under the influence of an emotion. Uterine excitability results at menstruation from an intense congestion; the vasomotor influx is manifested, as an artery, while between the periods the organ is inert and atalactic. In pathological conditions if the uterus is fibrous there is less vascular response and that is confined to the mucosa and results in hemorrhage. If there is infection dilatation is extreme, there is stasis, and it requires artificial stimulation to excite muscular peristalsis. The uterus is a true erectile organ. In the intermediate period the circulation is reduced to a minimum, as well as its reactional characteristics. At menstruation or pregnancy there is an increase in volume, an elastic tonicity, and an aortic pulse may be felt in its parenchyma; the temperature is elevated and its color becomes red or even violet, while peristaltic waves run through the tubes and the uterine body, especially when the organ contracts upon its contents.

A New Operative Procedure for Complete Prolapsus of the Uterus at the Menopause.—Theodor Landau (*Zent. für Gyn.*, Oct. 28, 1905) finds that after the operations for complete prolapsus of the uterus proposed by Freund, Wertheim and Fritsch, although results are satisfactory in most cases, in some patients operated on at the menopause there still remains the sensation of weight and dragging which was the chief inconvenience before operation. He proposes another procedure to be done in cases that have reached the climacteric, which he characterizes as a partial extirpation of the uterus, in which, by fixation of the posterior peritoneum of Douglas's cul-de-sac to the upper portion of the vaginal wall behind the urethra, and the utilization of a portion of the musculature of the uterus, a firm pelvic floor is constructed, which prevents prolapse of the bladder and the contents of the abdomen. This procedure is not accompanied by any technical difficulties, and by the closure of the posterior cul-de-sac the extirpation of the greater part of the uterus becomes entirely extraperitoneal, thus rendering the operation

entirely without danger. The technique of the operation he describes as follows: After disinfection of the parts, the prolapsed vagina and uterus are drawn forward as far as possible, grasping the vaginal portion of the cervix. A long incision is made in the anterior vaginal wall, beginning close to the urethra and extending to within two or three centimeters of the os uteri; the vaginal walls are detached, after incising the anterior lip of the cervix and separating the bladder walls; the plica vesicouterina is opened and the uterus luxated, being sharply anteflexed, so that the peritoneum of the posterior cul-de-sac can be reached, and by means of a suture of silkworm gut which takes in the substance of the uterus, the peritoneum is attached to the anterior vaginal wound, and the uterus is thus placed outside the closed peritoneal cavity. The posterior wall of the corpus uteri and the posterior lip of the cervix are both fixed by these means. The adnexa are removed and the body of the uterus being free, the greater part of that organ is resected with the upper portion of the posterior uterine wall, the lower part being left behind. The fixed point for the excision is the fixed vaginal posterior cul-de-sac. The remaining portion of the vaginal walls and the uterus are united by sutures. A high colpoperineorrhaphy makes a new rectovesical septum, into which the stump of the levator ani is sutured. By means of this muscle and the muscular portion of the uterus left in the wound the pelvic floor is so strengthened that prolapsus of the abdominal contents is prevented. ■

DISEASES OF CHILDREN.

Use and Abuse of Condensed Milk and Patent Foods in Infant Feeding.—No manner of simple dilution of water, writes George F. Still (*Practitioner*, Oct., 1905), can make the resulting mixture a suitable food for prolonged use for infants; either the carbohydrate must be excessive or the fat deficient, yet these foods may be of value for short periods under special conditions. In the dried milk preparations and to a less degree in condensed milk, the proteid is more easily digested than in fresh cow's milk; but the same result may be obtained by peptonization without giving an excess of sugar or deficiency of fat, while the transition to unpeptonized milk may be made gradually by reducing the time of peptonization. Peptonized milk, like patent food, may cause scurvy if used for more than a few weeks. Sodium citrate, one grain to each ounce of fresh milk, reduces the difficulty of digesting the curd and avoids this danger of scurvy. Except for a few of the hottest weeks in summer in dirty, crowded tenements, it is doubtful whether the increase in safety from bacterial contamination secured by the use of patent preparations outweighs the risks from their faulty composition. Starch-containing patent foods are useful sometimes for infants over nine months of age. These may profitably take such a food once or twice daily, but are almost

sure to suffer from digestive disorder if it is given at every meal. The use of patent foods for younger infants to diminish the firmness of the curd is unjustifiable, the same result is obtainable with sodium citrate. Useful as most patent food may occasionally be, the public has not the knowledge to discriminate between the conditions under which they may safely be used, and the physician's orders, unless most carefully guarded, are apt to be taken as a general sanction of the particular food, and to lead to its indiscriminate abuse.

Presence and Bacteriological Activity of Saccharomyces in Cow's Milk.—F. Valgussa and G. Mafera (*Riv. di Clin. Pediat.*, Nov., 1905) have studied the presence and bacteriological activity of saccharomyces in commercial samples of milk, with a view to obtaining data for the production of a new modification of milk suitable for artificial feeding, and give the results of their experiments as follows: In all the samples of milk purchased in open market, saccharomyces were found in greater or less numbers, whether the reaction were neutral or slightly acid, a marked acidity favoring their presence in large numbers. It was not found possible to classify these germs, but simply to group them, since they vary in form with the conditions of preservation and carriage of the milk. There are some germs belonging to the alcoholic ferments which are constantly found in milk, and among these are some that produce a strong odor in the milk. When lactic acid fermentation ceases the germs continue to live on the fats, albumins and secondary products. Under certain conditions these organisms prevent the action of parasitic germs on the albumins. Some of them directly coagulate the casein, making a fine precipitate, independent of an acid reaction; others segregate the milk ferments, and produce concentrated ferments of unusual power, such as amylolytic ferments, lactases, glucases, lipases, proteolytic ferments and probably caseases. The oxidizing and salol ferments remain unchanged. By the action of the saccharomyces it is possible to modify milk in its physical and chemical characteristics and its action on ferments, even when the milk has been previously sterilized.

Antitoxic Depreciation of Antidiphtheritic Serum.—L. C. Layson (*Amer. Med.*, Oct. 28, 1905) says that the results of Marx' tests, comprising 1138 lots, Miller's with 95 lots, and his own with 44 lots, all satisfying the conditions under which commercial antitoxin is kept, show that antidiphtheritic serum retains its potency much longer than has been supposed. The majority of serums do so for two to five years, when kept under the most perfect conditions. Under less favorable conditions, such as commercial antitoxin is rarely submitted to, the loss of antitoxic strength in one to five years varies from that which is inappreciable to 33½ per cent. Even the latter loss does not reduce the serum to below the labeled value as sufficient excess to cover the loss is added.

Antidiphtheritic Vaccination.—Ivo Bandi and Enrico Gagnoni (*Rivista di Clin. Ped.*, Oct., 1905) have demonstrated the value in the serotherapy of diphtheria of the specific antibactericidal principles, in distinction from the antitoxins, thus reinforcing the prophylactic properties of the serum. It has been demonstrated that it is necessary to introduce, either for cure or prophylaxis, a sufficient amount of specific antibodies to counteract the bacterial poison. This guards against the poison for a limited time only, dependent on the rapidity of elimination with other heterogeneous substances, of the antibodies injected. Elimination begins soon after injection, independently of the amount injected. The authors produced a vaccine to confer immunity by taking cultures on agar, which had been in the thermostat for four days, washing them with chloride of sodium and bicarbonate of sodium, scraping the culture and placing the whole in tubes, in a water bath, for two hours, at 55° C. Injections into animals are made, to determine its sterility, and it is allowed to stand for two days. The liquid is decanted, leaving the dead bacteria at the bottom. In this fluid are a large amount of endocellular poisons. With this animals are immunized. This produces an antitoxic immunity. It contains products of the metabolism of the germs, toxic products which have the toxiphoric properties destroyed by heat, and the haptophoric properties preserved, which stimulates the groups of cells to the formation of antitoxin. The authors have injected this vaccine in fourteen cases, pure in seven instances, in the rest, as is done in peste, with a certain amount of bivalent antidiphtheritic serum. The result of these injections proves that we can obtain in man an antibacterial and antitoxic immunity against diphtheria by injecting from one to two cubic centimeters of antidiphtheritic vaccine, without any reaction occurring. Most of the cases injected were convalescent from infectious diseases, and were debilitated. The grade of immunity is not in proportion to the reaction produced, but to the amount of vaccine injected. A revaccination reinforces the immunity. It now remains to determine how long this immunity lasts.

Prophylactic Measures Against Diphtheria.—P. Aaser (*Berl. klin. Woch.*, Sept. 18, 1905), after stating that experience has shown that isolation and disinfection are never perfectly carried out, and that it has been demonstrated that fumigation by sulphur does not kill diphtheritic germs, while conclusive experiments with formaldehyde have not been made, declares that we must have some other means of preventing the communication of diphtheria. Were it possible to isolate every person in whose throat Löffler bacilli were present, whether sick or well, no more cases would appear. This is not only impossible, but would be too expensive for the community as well as the individual. The author believes that we have an efficient prophylactic method in the use of antidiphtheritic serum to immunize

all persons exposed to the contagion. It has been shown that about 2 per cent. of persons exposed have bacilli in their throats, while showing no symptoms of the disease, and it is very doubtful whether such persons ever communicate the disease. The author made experiments on immunization in the wards of the Hospital for Epidemic Diseases in Christiania. Of 218 persons in the hospital one-half were immunized, and none of them took diphtheria; the other half were not treated, and of them seven took diphtheria. In the scarlet fever ward a case of diphtheria occurred. The other children were all immunized, and none took it. In the measles ward there appeared a case of croup with bacilli. It was impossible to remove the case, as all the wards were full. The children were all immunized, and no more cases developed. In croup, formerly 80 per cent. of the cases operated on died; now 90 per cent. are cured. It has been thoroughly demonstrated that the immunization is absolutely free from danger and almost without reaction. The author believes that when all patients are isolated until the throat and nose are normal, and the dwelling and all that it contains are disinfected and all the other members of the family are immunized the spread of diphtheria can be stopped. He advises the immunization of all school children when cases have appeared among them.

Pathogenesis of Diphtheria.—R. Schiller and P. Stenger (*Berl. klin. Woch.*, Oct. 16, 1905) calls our attention to the nasal mucous membrane as a frequent port of entrance for the germs of diphtheria. A slight discharge from the nostrils coincident with a diphtheria of the tonsils or pharynx will often give a pure culture of the Klebs-Löffler bacillus. They may be found in this discharge for a time without any symptoms, and later these may develop. In a case observed, the bacilli remained in the nose for fourteen days before a tonsillar operation. When that was performed the bacilli developed on the tonsils and an attack of diphtheria supervened.

Scarlatina Complicated by Nasal Diphtheria.—Albert Uffenheimer (*Münch. med. Woch.*, Sept. 9, 1905) records a very interesting case of undoubted scarlatina that had throughout the fatal illness a marked nasal infection, shown by the discharge of diphtheria-like membranes from the nostrils. Repeated examinations for diphtheria bacilli were made, without positive result until near the end of the case, when a few colonies of Löffler bacilli were found. By cultures and injections into animals these were proved to have been virulent. At the same time they were so few in number that it seemed impossible that they were the cause of the severe nasal inflammation, and the author thinks this must have been due to scarlatinal inflammation, with subsequent mixed infection with Löffler bacilli. This shows that not every case in which the clinical diagnosis is diphtheria is bacteriologically the result of Löffler bacilli. Such an inflammation can exist from scarlatinal infection.

Scarlatinal Otitis.—In writing upon this subject F. B. Sprague (*Amer. Jour. Med. Sci.*, Sept., 1905) mentions three instances of probable transmission of scarlet fever through the discharge from the ears of convalescents. The three children had fulfilled the Board of Health's quarantine regulations and had been set home with suppurating ears. Within ten days after this another child from each of the three families was admitted with scarlet fever. The writer believes the discharge from a scarlatinal otitis to be a good infection carrier, and that cases should be detained in an intermediate station, away from other children for at least two weeks after desquamation is complete. During this period the ears should have thorough antiseptic cleansing.

Kernig's Sign.—G. B. Hassin (*Med. Rec.*, Sept. 9) gives the following explanation of the pathogenesis of Kernig's Sign. When the thigh is flexed upon the trunk and the leg extended, the sciatic nerve is stretched. In the healthy state this seems to produce no pathological condition unless the flexion of the thigh is extreme. In morbid conditions when the nerve itself is affected, or the nerve-roots are, as undoubtedly is the case in acute meningitis, the stretched roots react; the posterior by producing pain, the anterior by producing contraction of the corresponding muscles which, in the case of the sciatic, are the flexors.

THE AMERICAN JOURNAL OF OBSTETRICS

AND

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DISEASES OF WOMEN AND CHILDREN.

VOL. LIII.

FEBRUARY, 1906.

NO. 2

ORIGINAL COMMUNICATIONS.

THE TOXEMIA OF PREGNANCY.

BY

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(With nine illustrations.)

ECLAMPSIA, acute yellow atrophy of the liver and pernicious vomiting, constitute a closely related group of lethal conditions in pregnancy which have long been the subject of diligent inquiry, yet some of the factors in their etiology will probably long remain obscure. The fullest acknowledgment of the obscurities connected with the etiology of these conditions should not belittle the progress which has already been made toward their solution. The important fact has been demonstrated, by evidence available for many years past and recently much amplified, that these conditions are autointoxications of one general type. Medical opinions and practice, however, have lagged far behind the progress of this knowledge, which in its present state demands that far greater care and watchfulness should be used, and much more effective and intelligent measures be employed by obstetricians to prevent the development of the dangerous toxic disorders of pregnancy and to combat them when present. The study of the following cases is offered as a contribution toward this end:

CASE REPORTS.

CASE I.—M. H., aged 21, previous health good, pregnant four and one-half months. For two weeks before admission suffered from continuous vomiting of all ingesta and constant headache. On admission, September 23, 1902, the patient's appearance was that of profound toxemia, mental state hysterical; at times real delirium alternating with drowsiness; tongue dry and coated; no edema or jaundice. The patient lived forty-eight hours, showing increasing somnolence, coma alternating with active delirium, and finally stupor. There were increased reflexes, muscular twitchings and a general convulsion before death. The liver dullness extended from the fifth rib to just above the costal border; edge not palpable. There were ptosis of the left eyelid, papillitis and hemorrhages near left disc. There were several attacks of epistaxis. Vomiting did not recur, but moderate jaundice developed on the last day. The temperature ranged from 98° to 103° F., falling to 97.3° shortly before death. Pulse 100 to 132. Respirations 30 to 40, and during coma, stertorous and of Cheyne-Stokes type. Urine fell from 28 oz. to 9 oz.; specific gravity, 1018; albumen a faint trace; no casts; no sugar; urea 1.1 to 1.4 per cent. (hypobromite method). Microscopical examination negative; no leucin or tyrosin. Leucocytes 11,000. On the presence of vomiting, cerebral symptoms, asthenia, and jaundice, a clinical diagnosis of acute yellow atrophy of the liver was made. (The clinical history and autopsy findings in this case were reported in full by Dr. Julius Rudisch and myself in Reports of the Mount Sinai Hospital, Vol. III.)

The *autopsy* by Dr. Libman showed: *Liver*: weight 1,575 gm. (3 1-6 pounds), consistence somewhat soft; section very fatty; with many slightly elevated, ochre yellow areas, surrounded by a red rim, and varying in size from a pinhead to 5 mm. in diameter, mainly grouped about central veins. *Spleen*: 200 gm., markedly congested and soft. *Kidneys*: congested, cortex yellowish, pelvis and both ureters dilated to size of lead pencil. *Brain*: dura and sinuses negative; cortex edematous; thin exudate at base; moderate internal hydrocephalus. *Uterus* contained a dead male fetus, 23 cm. in length. Heart, lungs, and other organs were negative. Bacteriological examinations showed the presence of streptococci and a gram-negative short bacillus in the spleen. Spreads from the exudate at the base of the brain showed no bacteria and few leucocytes.

Microscopical Examination of the Liver (see Figs. 1, 2, 8).—The striking feature is an excessive degree of fatty change in the cells and small areas of rapid necrosis. The outermost cells of the lobules appear without any fat vacuoles. The remaining cells, with the exception of a small region midway between the central vein and the edge of the lobule, contain many small globules of some fat-like substance. Among them are cells

EXPLANATION OF PLATE I.

Fig. 1. Liver, Case I (x 150) showing necrosis in intermediate zone of lobule.

Fig. 2. Sector indicated in Fig. 1 (x 300). A—zone of advanced necrosis. Remainder of lobule showing marked fatty change and beginning necrosis.

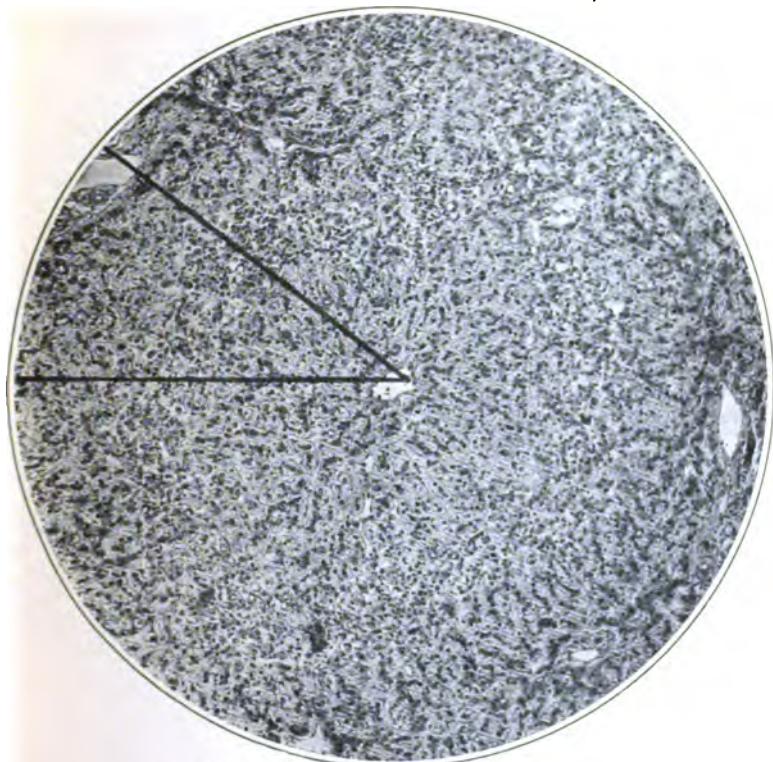


Fig. 1.

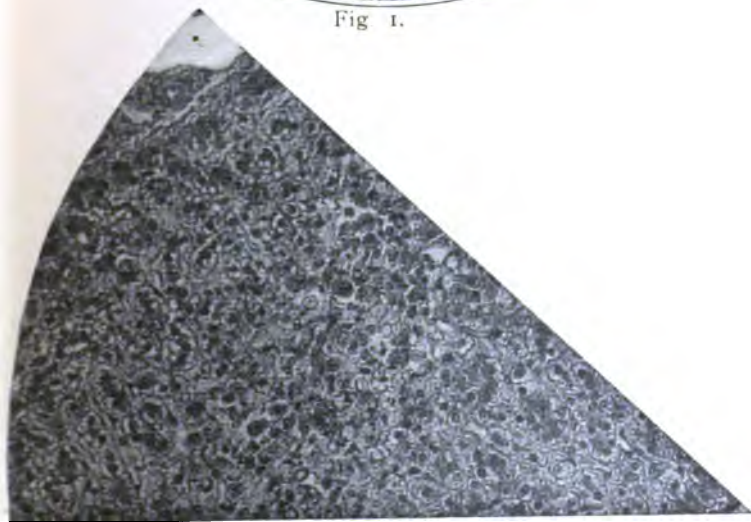


Fig. 2.

STRAUSS—TOXEMIA OF PREGNANCY.



whose contour is irregular, whose nuclei are shrunken, and intensely stained. These cells are necrotic. In a portion of the middle third of the lobule the most marked necrosis is seen. Here the cord-like arrangement of the cells is gradually lost. The cells become smaller and stain intensely with eosin. Those cells lying at the periphery of the necrotic zone show evidences of fatty degeneration, whereas the cytoplasm of those in the center is homogeneous and hyaline. The nuclei are at first shrunken and shriveled, stain intensely, and then disappear altogether, leaving small clumps of distorted eosin-staining cytoplasm. The whole picture is one of rapid necrosis* superimposed in part upon a process of fatty degeneration. The area involved in the necrosis varies in different lobules, both as to extent and position, sometimes lying close to the peripheral zone and at other times to the central one, but always in the middle zone and yet occupying but a small part of it.

The capillaries are open and dilated in places, but there is no marked congestion. There does not appear to be marked proliferation of the endothelial cells. The branches of the portal vein and hepatic artery show no change. The bile ducts are normal and show no tendency to proliferation.

Summary.—This case is an excellent example of a severe toxemia and from its clinical symptoms warranted the diagnosis of acute yellow atrophy of the liver. The cranial nerve involvement is like that observed in a case reported by Schmorl as eclampsia without convulsions.

His case in brief was as follows: 23 years of age, third pregnancy. Became ill on March 2, 1893, with headache, slight dizziness and diplopia. Oculist made out a paralysis of the left oculomotor, a very marked distention of veins in background of eye and a slight degree of choked disc. Twenty-four hours later became very somnolent, stuporous and finally completely unconscious. Examination in hospital showed no edema, the left eye prominent and the left pupil markedly dilated. Internal organs negative. Urine showed no albumin, no sugar and no casts. Uterus reached to umbilicus. On March 4 pulse became rapid, edema of lungs appeared and death followed. Urine showed slight amount of albumin and a few hyaline casts. The autopsy showed hemorrhages on various parts of the brain surface; multiple pin-point hemorrhages in the cortex; destruction of the left oculomotor and olfactory nerves by hemorrhage; thrombosis of left cavernous sinus and softenings in cerebellum and central ganglia. The other organs showed the typical anatomical findings of eclampsia.

Our case had none of these extensive lesions in the brain, but in their place an exudate at the base and a slight degree of internal hydrocephalus.

CASE II.†—*Clinical History.*—Mrs. —, 21 years of age, previously

*The microscopical examination published here is an amended form of that previously published in the Hospital reports, as the result of further studies of material by Dr. F. S. Mandlebaum and the writer.

†For the clinical history of this case I am indebted to Dr. Rudisch and Dr. E. Libman.

in good health, became pregnant for the first time in September, 1898. In November and December she suffered from incessant vomiting. In January (1899) the vomiting increased in severity and dilatation of the cervix was performed. This gave no relief, and all nutrition by the mouth was stopped and rectal feeding resorted to. At this time the patient's pulse was 136, her temperature 101.5° F., and albumin was present in the urine. Feeding by mouth was resumed and frequent lavage practised. The vomiting suddenly ceased. In June labor was induced before full term, because of a narrow pelvis, and a dead child was delivered by the high-forceps operation. Second pregnancy commenced in October, 1901, and there were occasional attacks of vomiting throughout November, December and January. Lavage always gave relief. The patient was not as ill as during the previous pregnancy. The child was delivered two weeks before full term, but lived only three days. In 1902 patient suffered from renal colic and passed a calculus. Third pregnancy began in January, 1903. During the early months she had some nausea and occasional vomiting, which lasted until April. Her general condition remained good. In May and early part of June the vomiting recommenced but was not severe. At this time albumin was occasionally found in the urine. Late in July (seventh month) began to suffer from obstinate vomiting, constipation, and sleeplessness. The general physical condition was good. There was no edema, no icterus, no headache. The respiration and temperature were normal; the pulse ranged from 92 to 96. The vomitus consisted of food and often of only water and mucus. The vomiting bore no definite relation to the taking of nourishment and varied in frequency from six to twelve times in twenty-four hours. The administration of morphine hypodermically, and of small doses of cocaine by mouth, did not have much influence on the vomiting. About this time the urine was of high color, showed considerable albumin, hyaline and granular casts in abundance; urea normal in quantity (hypobromite method); specific gravity 1018. The condition of the patient remained unchanged at the end of a week (August 8) and nutritive enemata were given, though nourishment by mouth was continued. On one occasion at this time the vomitus contained a little blood. She slept for only short periods and at times was very restless, although she was continually receiving morphine. On Aug. 10 her general condition became worse; she was decidedly weaker and the pulse rose to 120. Vomiting was more frequent and vomitus consisted largely of bile. Icterus developed. The induction of labor was decided upon and the cervix was dilated. A living child was delivered twelve hours later. Five hours after delivery hypodermoclysis was performed, followed shortly afterwards by an intravenous infusion for collapse. During all this time the vomiting continued and six hours after the induction of labor black vomit occurred. For a day of two preceding labor the mental condition of the patient was one of extreme anxiety and great restlessness; following the delivery there were periods when patient talked at random, but for the most part she was in a somnolent state. Aug. 13. Patient continued vomiting, although nourished only by rectal enemata. The pulse rose to 140 and became so feeble that active stimulation was required. The temperature remained 100° F. Icterus continued. Aug. 14.

Patient steadily growing weaker; pulse 140; temperature rose to 102°, vomiting continued. Somnolent. Aug. 15. Patient comatose until death. Temperature five hours before death 104° F.

The *urine* with the exception of the occasional presence of a very small quantity of albumin showed no pathological change until just before the obstinate vomiting commenced late in July. Then it showed a heavy precipitate of albumin, hyaline and granular casts and a specific gravity of 1015. Quantity of urea normal. After this the specific gravity ranged from 1018 to 1025; the urine was high-colored; indican and skatol marked; albumin, a trace; a few hyaline casts; urea normal (hypobromite method). Toward the end the albumin again increased, and numerous casts and leucocytes were present. The amount of urine passed until five days preceding death varied from 18 to 38 oz.; the average was 26 oz. On Aug. 11, when her condition changed for the worse, the quantity of urine fell to 6 oz., and on the following days was 11, 14, 12 and 8 oz. respectively. During these days it was alkaline, without albumin; no acetone; but always highly colored. One week before death the urine was examined for leucin and tyrosin microscopically, with negative result.

Autopsy.—Six hours after death, Aug. 15, 1903. Body well nourished. No rigor mortis. Panniculus adiposus fairly well marked. No hemorrhages on peritoneal surfaces. Small quantity of blood-tinged fluid in abdominal cavity.

Liver.—*Macroscopical Examination.*—Its free border was placed a considerable distance above free border of ribs. Consistence very soft. Impression of finger retained. Capsule smooth and glistening. Weight, taken two days after autopsy, was two pounds. Appeared somewhat smaller than normal. Cut surface smooth, pale yellow, dotted with small red spots. The small red areas appeared to lie mainly around the central veins, while the periphery of the lobule was of the yellow color characteristic of fatty change. There was considerable congestion. No areas had appearance of red atrophy.

Microscopical Examination of the Liver (See Figs. 3, 4).—All the lobules exhibit an area of necrosis comprising more or less of the middle third. In many of them the necrotic process is more extensive, encroaching upon both the outer and inner zones, but more especially the latter, until in some instances there is left nothing but a peripheral fringe of normal parenchyma. The outermost cells, to the depth of twelve or fourteen, have the appearance of normal liver cells except that some show a mild degree of acute granular degeneration. They usually contain a few fat droplets which are increased in number in the cells nearest the center. The remaining cells of this zone afford a striking contrast to these. The granular protoplasm of the normal cell has disappeared and been replaced by numerous small vacuoles (fatlike substance); the cells are smaller; the nuclei irregular, shrunken and deeply stained. The picture is one of fatty degeneration and gradual destruction of the cell. In this region the cells gradually lose the normal cord-like arrangement. The cells of the middle third of the lobule have the appearance of coagulation necrosis. All semblance of a columnar arrangement is gone. Some cells are vacuolated and thus give evidence of probable previous

fatty infiltration. Where the necrosis involves the greater part of the lobule the center of the necrotic area can only be described as detritus and collapsed walls of capillaries. Where only the middle zone is necrotic the changes in the cells of the inner zone correspond to those described as occurring in the peripheral third; the normal liver cells in such a case lying next to the central vein. Some of the necrotic cells contain bile pigment. There is no congestion of the capillaries and very few red blood cells are to be seen. Leucocytes, principally mononuclear, are present in the necrotic area, but not in excessive numbers. The large vessels are empty. When the necrosis extends to the cells about the central vein it appears collapsed. No thrombi are to be seen. When the slide is examined with transmitted light by the naked eye the section appears mottled, the necrotic areas being very distinct because of their deeper stain with eosin.

Gall-bladder: Distended with bile. Mucosa normal. Ducts pervious. *Spleen:* Not enlarged; congested; pulp soft; Malpighian bodies swollen. *Stomach:* Contained about five ounces of black-colored fluid. Mucosa covered with mucus. No ulceration. A few ecchymotic spots at fundus. *Small Intestine:* With exception of duodenum, markedly contracted, empty and pale. The duodenum was somewhat distended and contained bile-stained fluid. Its mucosa was considerably injected. *Large intestine:* Negative. *Pancreas:* Negative. Microscopically shows slight cloudy swelling. *Kidneys—macroscopical examination.*—About normal in size, succulent, congested. Capsule not adherent, surface smooth. On cut section the cortex appeared swollen and pale yellowish. Markings fairly distinct. Pyramids congested. Pelves dilated, that of right kidney markedly so. Some injection of pelvic mucosa. Both ureters were dilated, the right especially, which measured almost 1.5 cm. in diameter. Probes were passed through into the bladder, but with some difficulty in the right one, due, possibly, to a stricture near the trigonum. There was no stone. *Microscopical examination.*—Epithelium in all the tubules markedly swollen and granular. In places the nuclei were indistinct. Bowman's capsules are thickened and the endothelial cells of the glomeruli appear increased in number. In places there is an increase of old connective tissue between the tubules. *Adrenals* (the left one examined) appeared larger than normal and of exceptionally yellow color. Microscopically the cells of all zones appear to have undergone marked fatty change. *Bladder:* Small ecchymoses in mucosa. *Uterus:* Reached as high as umbilicus. Very soft and flabby. Endometrium covered with a greenish-black, foul-smelling membrane, which in places was about 3 mm. in thickness. Microscopically this membrane contains polynuclear leucocytes, streptococci, and some long, spore-bearing bacilli.

Anatomical Diagnosis.—Pregnancy; acute degeneration and necrosis of the liver with atrophy; acute parenchymatous degeneration of kidneys;

EXPLANATION OF PLATE II.

Fig. 3. Liver, Case II (x 150), showing necrosis in inner and middle zones of lobule.

Fig. 4. Sector indicated in Fig. 3 (x 300). A—zone of advanced necrosis; b—peripheral-fringe of normal liver cells; c—zone of cells showing marked fatty change and beginning necrosis.

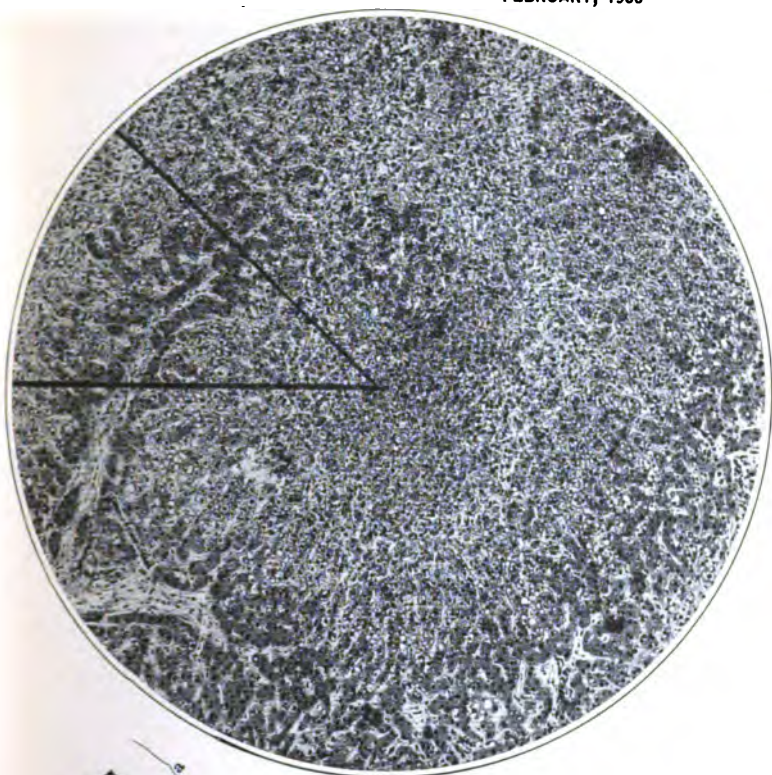


Fig. 3.

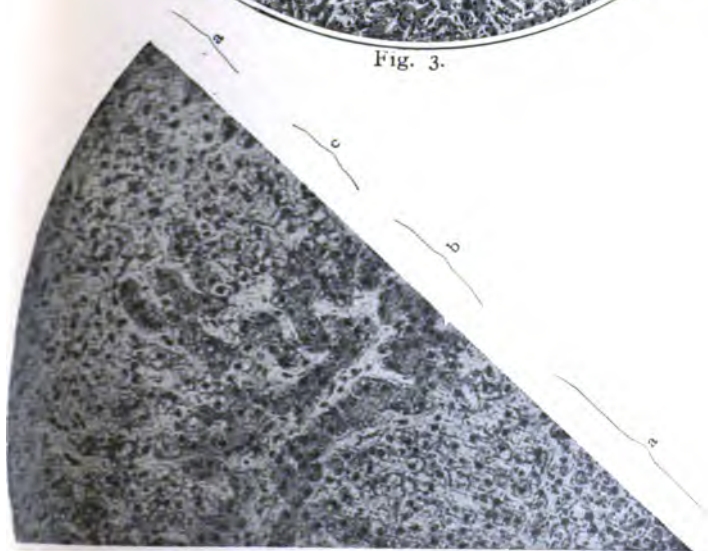


Fig. 4.

STRAUSS—TOXEMIA OF PREGNANCY.

moderate chronic nephritis; dilated ureters; acute cystitis; subinvolved uterus with infected endometrium.

Summary.—This case presents the all too common picture of pernicious vomiting of pregnancy.

The clinical symptoms even warrant a diagnosis of acute yellow atrophy, though they were not so typical as in Case I. The case illustrates the tendency of this form of toxemia of pregnancy to recur in successive gestations, especially when they follow each other at short intervals. Furthermore, this case shows the tendency of such patients to become septic after parturition. The delivery of the child was conducted with the most rigorous asepsis, yet despite all the care and precautions taken the endometrium became infected. Lastly, it is an example of the cases where the toxic process is allowed to continue for some time, the induction of labor comes too late to be of help, because the toxemia has depleted the vitality of the body to such an extent that the metabolic processes cannot recover their normal status, and the injury done to the liver especially is beyond repair.

CASE III.*—*Clinical History.*—J. L., aged 28. Admitted to hospital May 7, 1902. Neurotic temperament. A first pregnancy was interrupted at the third month on account of melancholia. It had been attended by considerable nausea and vomiting. For the past year had suffered from several mild attacks of pain in right iliac region. The second pregnancy dated from about Sept. 15, 1901, and progressed with only the usual physical inconvenience until Jan. 17, 1902, the beginning of the fifth month of pregnancy, when there was a severe attack of pain in iliac region which suddenly disappeared after a few hours' duration. A similar attack occurred on May 7, toward the end of her eighth month. Thereafter intermittent milder attacks of pain seemed to dominate the clinical aspect of the case and diverted attention from any symptoms of hepatic toxemia that may have been present. It is not probable that any pronounced symptoms of toxemia were present until the last few days of the history of the case. The urine was found normal according to the usual methods of examination. During this latter period the patient was considerably prostrated but did not vomit, being most of the time under the influence of opiates. On May 12 spontaneous delivery of a dead eight months' fetus occurred. Afterwards the pulse, previously rapid and feeble, gradually failed, temperature remained normal, coma and stupor developed, but there were no convulsions. The urine contained a trace of albumin, no casts, a few red blood cells. Death on May 14.

Autopsy: Six hours after death. Body well nourished, rigor moderate, no jaundice, no edema. *Heart:* Normal. *Lungs:* Considerably

*I am indebted to Professor James Ewing for the privilege of publishing this case, and for his kind assistance in the preparation of this article.

congested. *Liver*: Size normal; consistence distinctly reduced. Section shows *pronounced nutmeg appearance*. *Kidneys*: Size normal; capsule free; cortex slightly thickened; organ moderately congested; consistence slightly reduced. *Spleen*: Slightly swollen, dark red, consistence normal. *Peritoneum*: Pelvis contains half an ounce of blood-stained fluid. *Uterus* shows size and relations of post-partum organ at term. The right *ovary* is enlarged, measuring $3\frac{1}{2}$ inches in diameter, forming a firm, rounded tumor. It is twisted one complete turn on a narrow pedicle and is infiltrated with blood. *Bladder*: Mucosa congested; contains a few drams of turbid urine. *Gastrointestinal tract* contains a little fecal matter and mucus; otherwise negative.

Anatomical Diagnosis.—Acute congestion and degeneration of liver; partially strangulated ovarian tumor.

Microscopical Examination of the Liver (See Figs. 5, 6).—At the periphery of some of the lobules there is a fringe of cells one or two deep which appear normal. In some of the lobules these are distinctly hypertrophied and are thus like cells in a similar position in two cases of typical acute yellow atrophy which I have observed. The remaining cells in the outer third of the lobule are enormously swollen and so completely infiltrated with small fat drops that no eosin-stained cytoplasm remains. Many of them show nothing but a faint network of granular matter, and give the impression of having undergone hydropic degeneration. Their nuclei are often shrunken and deformed or have disappeared altogether, so that the cells are to be regarded as having undergone a form of fatty degeneration and necrosis. These large fatty cells still maintain the columnar relation of normal liver cells, but in places the capillaries between the columns have become obliterated because of their great increase in size. The appearance of these large fatty cells in this particular region has its counterpart in cells in the same region in cases of acute yellow atrophy mentioned above. (See Fig. 7.) The cells in the remaining two-thirds of the lobule have undergone coagulation necrosis. They maintain the cord-like arrangement. They stain intensely with eosin; are smaller than normal, especially toward the center of the lobule; their contours are irregular; the cytoplasm in most of them, especially in the area surrounding the central vein, is homogeneous and hyaline; the nuclei are in the various stages of disappearance. Some of those cells near the periphery of the necrotic area are vacuolated, but not to the degree observed in the large cells described, and some of them contain hyaline bodies which stain with eosin. The capillaries, especially those in the middle and inner zones of the lobule are markedly dilated and filled with red blood cells. There are no agglutination thrombi. The leucocytes are very abundant in the ne-

EXPLANATION OF PLATE III.

Fig. 5. Liver, Case III ($\times 150$), showing complete necrosis of inner two-thirds of lobule with marked congestion.

Fig. 6. Sector indicated in Fig. 5 ($\times 300$). A—zone of hyaline necrosis with disintegration at its inner part. Capillaries congested; b—zone of large hydropic cells (Fig. 7); c—peripheral fringe of normal cells. Section shows that appearance of cords of liver cells is fairly well preserved in necrotic area.

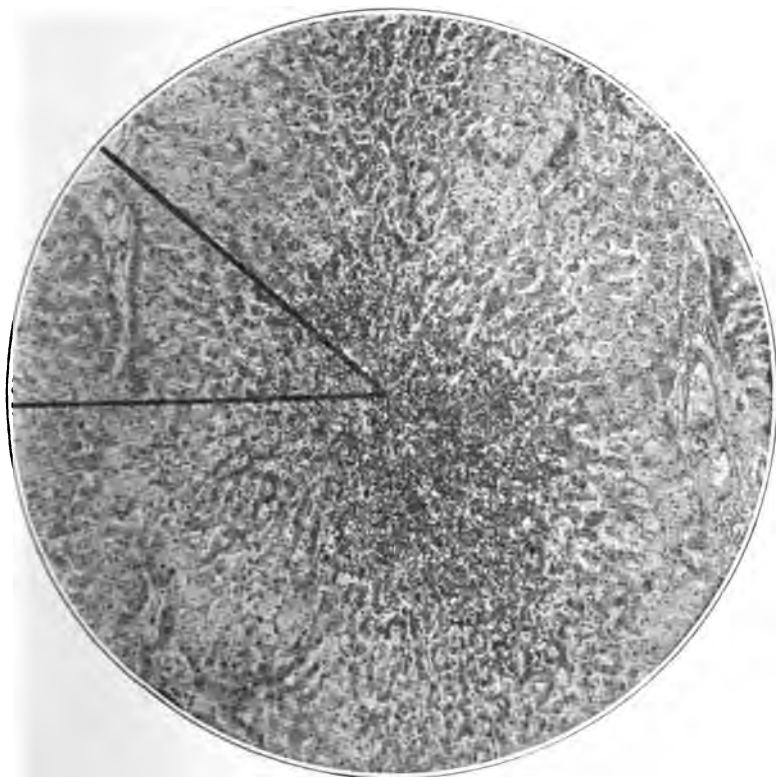


Fig. 5.

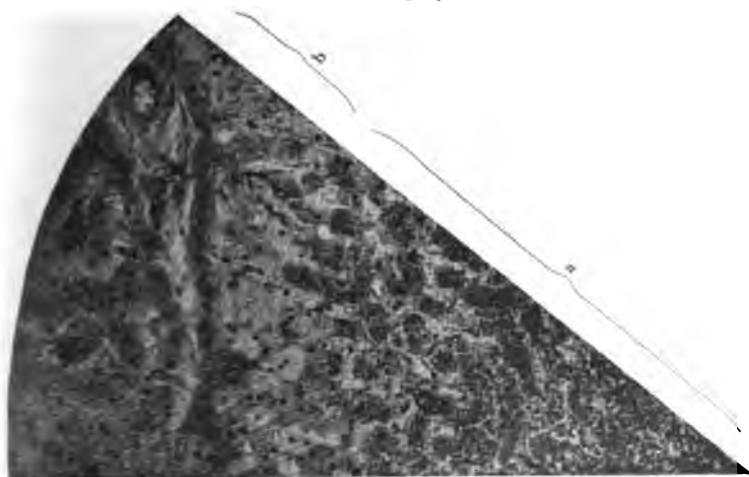


Fig. 6.

STRAUSS—TOXEMIA OF PREGNANCY.



cretic area and the endothelial cells are swollen. The congestion in these lobules is in marked contrast to its absence in the other two cases. Portal vessels and gall ducts normal. *The kidneys* show considerable granular degeneration of tubule cells. The glomeruli are normal. There is a slight increase of connective tissue in some isolated foci. *Lungs*: Some congestion and edema and a few areas in which the air vesicles are filled with blood. *Heart muscle* is normal. *Spleen*: Congested. The *ovarian tumor* consists of one large and several smaller cystic compartments



Fig. 7. Case III (x 300). Large hydropic cells shown at b in Fig. 6. Resemble those found in typical case of acute yellow atrophy of liver.

walled by cellular fibrous tissue derived from the ovarian stroma. The cavities are filled with bloody fluid, and the tissue is infiltrated with blood but not necrotic.

Summary.—Case III was not suspected clinically to be one of toxemia, so that an account of the symptoms pointing toward toxemia is rather meager. The presence of a large ovarian cyst with a twisted pedicle also complicates the interpretation of the case. The first pregnancy was attended by nausea and vomiting and had to be interrupted because of the development of vomiting and melancholia. These facts warrant us in assuming that a state of toxemia was present at that time.

The severe attacks of pain in the right iliac fossa must have been due chiefly to the circulatory changes in the ovarian cyst dependent upon torsion of the pedicle. The prostration from which the patient suffered in the latter part of her pregnancy may have been an expression of the toxic state. Certainly the manner of death would appear to justify this conclusion. However, I am at a loss as to how much stress to lay upon the rôle played by the ovarian cyst with the twisted pedicle, because usually such a condition can produce not only severe pain but

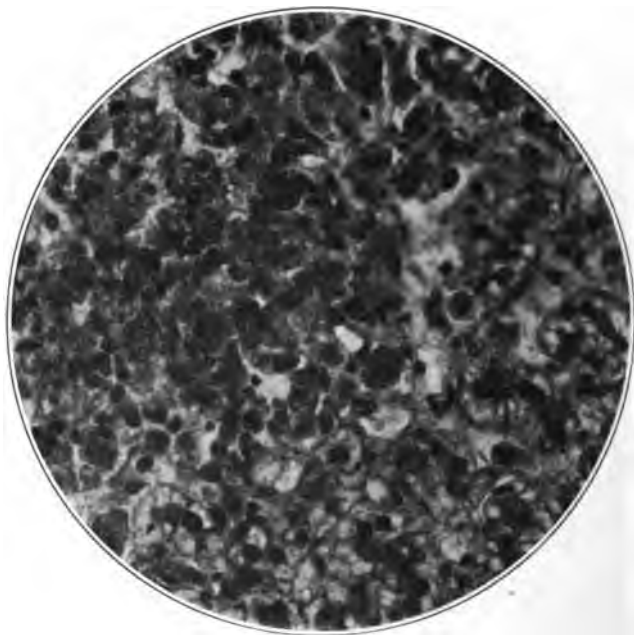


Fig. 8. Case I ($\times 300$). Destruction of hepatic cords in zone marked "a" in Fig. 2.

nausea, vomiting and marked prostration. They, however, seem to cause the most serious clinical manifestations when they are necrotic and have given rise to a peritonitis which may become of a general purulent nature and cause death. In this case there was no such necrosis or peritonitis. The doubt is all the more intensified from the fact that Paltauf mentions a case of acute yellow atrophy resulting in death two days after laparotomy had been performed for an ovarian cyst with a twisted pedicle. There was no septic infection, and he regards the case as one arising from the absorption of cytolytic (autolytic) fer-

ments. He does not mention any possible relation to pregnancy, or to delayed chloroform poisoning. I can only say, in view of the fact that our case was pregnant and that Prof. Ewing has the liver of a case of eclampsia which shows the identical lesion that this one does, that the case is probably but not absolutely one of toxemia of pregnancy.

Pathological Anatomy.—The pathological condition in the three cases presented is one of necrosis and degeneration and the organ most affected is the liver. The liver of Case I shows a marked fatty degeneration affecting all the cells except a few at the periphery of the lobule which are normal and a small area in the middle third which has undergone a more rapid necrosis. The liver of Case II presents the same picture except in that it is more marked. We find normal liver parenchyma at the periphery of the lobule, the number of normal cells varying in the different lobules. The remaining cells in the outer third of the lobule are found infiltrated by fat and are degenerating, and in the middle zone in all the lobules and in the middle and inner, in some, the cells show various stages of coagulation necrosis. In some instances even the outer zone is affected by necrosis, but the starting point of the rapid necrotic process in this case, as in the first, appears to be the middle zone. In the third case there is again a very narrow fringe of normal liver cells followed by cells in various stages of fatty and hydropic degeneration, and then two inner zones which are completely necrotic and show from their appearance and staining that the necrotic process in them has been more rapid and pronounced than in the rest of the lobule. The necrosis is a coagulation necrosis and the cells appear hyaline.

All three cases, therefore, show the lobules to have been the site of intense fatty degeneration, and, in addition, of hyaline necrosis. The necrosis in every case affected the middle zone and in two cases the central and even parts of the peripheral as well. Moreover, the parts which are necrotic give evidence, by the presence of vacuoles in the cells, of having previously undergone fatty degeneration.

The fact that the liver lobules can be divided into zones according as they are affected by different pathological processes has been known for a long time. Rindfleisch called attention to the occurrence of amyloid degeneration first in the middle zone. Virchow divided the lobule into three zones and noted that the peripheral one was most often the seat of fatty degenera-

tion, the middle the seat of amyloid change, and that pigment was deposited in the zone of cells about the central vein. Mallory, in 1901, as the result of an examination of the livers in a large number of cases, was the first to describe necrosis occurring in the central zone of the lobule and sometimes involving the middle part of the peripheral zone in addition. He designated the lesion as "central necrosis" in contradistinction to "focal necrosis." He likewise stated that he had found no previous mention of a similar condition in the literature except the type of necrosis described by Smith and Kilbourne in their study of Texas fever. Mallory's description corresponds closely to the pathological picture presented by our cases.

Stone next reported a fatal case of pregnancy in which the lesion described was one of intense fatty degeneration and of necrosis which occupied the periphery of the lobule.

In 1904, Opie reported a study of the livers of 500 autopsies in which he found instances of necrosis in all three zones. In only four of the cases was the peripheral zone necrotic. They were all from pregnant women and three of them, in addition to necrosis, presented the characteristic appearance of acute hemorrhagic hepatitis of eclampsia described by Jurgens, Schmorl, Lubarsch, and others. These ought not to be classed among the cases of zonal necrosis, for the lesion is not very regularly confined to the zone. The fourth case showed a hyaline necrosis of the peripheral zone. The case is interesting as being that of a pregnant woman in whom Cesarean section had been performed and who died six days later from suppurative metritis and acute general peritonitis. It was the second pregnancy and is reported to have had a normal course, so that it is a question as to how much the pregnancy had to do with the necrosis in the liver. Necrosis in the middle zone of the lobule was found in 9 of the 500 cases and likewise in 5 instances in additional material. Opie described the necrotic cells as hyaline, staining deeply with eosin, reduced in size, and occasionally containing hyaline droplets or globules. The nuclei have disappeared or are degenerating and the cells have lost their columnar arrangement. He calls attention to hemorrhage as a conspicuous feature of the necrotic zone, red blood cells being numerous outside the walls of the capillaries. Mallory noted this condition in some cases and classified such as a hemorrhagic type. Opie found no fibrin and no thrombi. In ten of the cases there was intense fatty degeneration which in most instances

was limited to the central zone. He states that though he occasionally found hyaline cells vacuolated as if by fat, there was usually no evidence of the cells having undergone fatty degeneration before they had become necrotic. We, however, always found, at the border of the necrotic zones, cells which stained intensely with eosin and yet contained numerous small vacuoles, so that we feel justified in assuming fatty degeneration to have commenced in them before they had undergone hyaline necrosis.

Opie found three cases in which necrosis involved both the middle and central zones, and in two of them he noted that although coagulation necrosis had destroyed the central zone, its cells still retained their columnar arrangement, whereas this had been lost in the middle zone and a disorganized cell detritus resulted. This fact, which we have also noted in our cases, is important to bear in mind in considering the relation of this lesion to acute yellow atrophy.

Doyon (1905) has produced necrosis and fatty degeneration in the livers of dogs by feeding them chloroform and by the injection into the peritoneum of a hepato-toxin made according to the plan of Delezenne. The necrosis caused by chloroform generally comprised the central part of the lobule; that by the hepato-toxin was irregular in its distribution.

The explanations offered for the zonal distribution of necrosis in the liver are at present very unsatisfactory. The older pathologists explained the occurrence of amyloid degeneration in the middle zone by assuming this to be the region where the capillaries of the hepatic artery anastomose with the portal system. We now know, however, that this anastomosis takes place near the periphery and within the peripheral zone of the lobule. The intravital injections of India ink or carmine suspensions made by Opie into the circulation of dogs show that both the portal vein and hepatic artery send their blood into the peripheral part of the lobule, and here the arterial blood pressure is strongest. Opie concludes from this that "when foreign material reaches the liver by the portal vein it is washed from the peripheral zone by the arterial blood and tends to be deposited in a middle zone where the influence of the opposing circulation is less strongly felt. Hence it is not impossible that toxic substances capable of causing necrosis of the hepatic cells brought to the liver by the portal vein might first exert their effect upon cells within the mid-lobular zone." It may also be that there is more or less stasis of the blood current in the mid-

zonular region, which permits of a more prolonged action of a noxious agent in the blood on the parenchyma. The fact also that the cells in this region are not so well supplied with arterial blood may account for a lessened resistance. Yet all these theories do not explain the necrosis when it occurs in the central and peripheral zones, although they tend toward elucidating the far greater frequency of necrosis in the mid-zone.

It is an important fact that the presence of zonal necrosis can often not be recognized by gross examination of the specimen. Mallory makes the statement that only in a few cases were the necroses seen by the naked eye. The markings of the lobules are usually distinct and their central and middle parts stand out plainly because of the congestion, so that the gross picture on section is very much that of a nutmeg liver. In five of Opie's cases the necrotic mid-zone could be recognized by the naked eye as a deep red circle within the lobule. In one case where the central zone as well was involved in the necrosis the central part of the lobule had a brick-red color surrounded by a zone of bright yellow. In Stone's case the liver showed no evidences of necrosis. Regnaud and Devilliers describe the liver in a case of eclampsia as having a nutmeg appearance. They make no mention of further findings. Of our three cases, the liver of Case I, showed nothing typical; that of Case II showed distinct lobules with their centers a dark red and the periphery a light yellow color; that of Case III was described as of nutmeg appearance.

Meyer-Wirz describes the liver of a case of eclampsia without convulsions as follows: Surface covered with sub-serous confluent spots which looked like hemorrhages. Cut surface showed many punctate hemorrhages; markings of acini very plain; center pale brown; periphery pale yellow. The microscopical examination, however, showed no hemorrhage but what was mistaken for such turned out to be areas of necrosis. Schmorl has called attention to this same fact, namely, that what were and are frequently regarded at the autopsy table as hemorrhages in the liver are, in truth, areas of necrosis.

From these facts it is plainly evident that the diagnosis of zonal necrosis in the gross specimen is often impossible and that reliance can be placed upon microscopical examinations only. Here also we find an explanation of the many instances of negative findings in the liver of patients dead from eclampsia or hyperemesis gravidarum.

The liver varies in size and weight very much. Opie found the weight to range between 1600 and 2000 grams, though one case which in its clinical aspects seemed to resemble acute yellow atrophy very closely had a liver weighing only 1,000 grams. In Stone's case the liver was likewise below the normal, since it weighed only 36 ounces. Our cases showed a diminution in weight only in Case II, where the liver weighed two pounds. In consistence the liver is usually soft and flabby.

Next to the liver in importance in these cases are the kidneys. Sections made of all three show no change more severe than a granular and fatty degeneration. Of some interest, because of a theory of the etiology of eclampsia, is the fact that in Cases I and II the ureters were dilated. The dilatation was especially marked in those of Case II, where there was also a slight stricture in one.

Relation of Cases of Severe Toxemia to Acute Yellow Atrophy.—The clinical description presented by Case I answers to that of a severe toxemia. The clinical entity which it most closely resembles is known as acute yellow atrophy of the liver. This was the diagnosis made by Dr. Rudisch, and under this heading the case was originally reported by us. At that time we described the lesion as one of zonal necrosis and compared it with the typical lesion of acute yellow atrophy. We came to the conclusion that, although some pathologists might be loath to consider the zonal type as belonging to the group of acute yellow atrophy, it did belong to that group in view of the clinical history of the case, and the nature of the liver changes. Since the publication of that paper Opie has taken the same stand in his discussion of certain cases of midzonal necrosis and Ewing has done likewise.

Acute yellow atrophy is universally recognized as being due to some toxic agent, bacterial or otherwise. Matthieu attributed the condition to a "poison zymotique." Rosenheim considered it to be due to the product of bacterial metabolism. Meder holds "the etiology of acute yellow atrophy cannot be a uniform one when the diversity of the clinical and anatomical pictures is taken into consideration; but doubtless the infectious agents and the products of their metabolism play an important rôle." Rolleston, in his recent work on Diseases of the Liver, says, "It is probable that a number of poisons or microorganisms may give rise to acute yellow atrophy. At present it is not known where they are produced. But whether taken by the mouth, found in the alimentary tract, in the liver itself, or elsewhere in

the body, the liver suffers as a whole." And again, he says, "The essential factor is a very acute degeneration of the liver cells resembling that produced by bacterial toxins."

The macroscopical appearance of the liver in acute yellow atrophy and in zonal necrosis varies greatly. The older writers described the liver as enlarged in the early stages of the disease, whereas Rolleston says the liver is always greatly diminished in size, and considers this fact a criterion in differentiating the cases of atrophy from those of icterus gravis, which he regards as an allied condition. However, he does not state after how long a duration of the disease we can expect to find this marked atrophy. In the case of typical acute atrophy mentioned above as reported in conjunction with Case I, where the microscopical examination shows the typical picture, the duration of the disease was one month, and yet the liver weighed 43 ounces, which is about normal. The gross appearance was that of yellow atrophy without any very marked signs of red atrophy. In Stone's case of zonal necrosis in which the diagnosis of acute yellow atrophy was made at the autopsy, the liver was yellow in color without any signs of red atrophy, and weighed only 36 ounces. In one of Opie's cases, a primipara, after an illness of at least four weeks' duration the liver weighed only 1,000 grams, was bright yellow in color, no red color noted, and histologically showed zonal necrosis. In Case II the weight of the liver, taken two days after death, was 32 ounces. The duration of the acute stage of illness was a little over three weeks. In Case III the size of the liver was normal. Both in cases of recognized acute yellow atrophy, therefore, and in cases of zonal necrosis the weight of the liver may be normal or may be decreased, and this, too, without the appearance of any red atrophy. The ground, therefore, that the lesion in the livers of these fatal cases of pregnancy cannot be considered as belonging to the group of acute yellow atrophy because the organ has not the requisite diminution in size is untenable.

There is a divergence of opinion as to whether the peripheral or the central part of the lobule is the first to be affected by the necrosis. In most text-books on pathology it is stated that the first appearance of the lesion is in the periphery of the lobule. Rolleston describes the first and early changes in the cells as taking place in the periphery, and passing in toward the central vein. Meder says that in the majority of cases the periphery of the lobule is most affected, though there are cases in which it

extends over the whole lobule and affects the central part as well. He asserts that in most instances it is the central part of the lobule which remains longest intact. Paltauf (1902) describes the process as one of extreme necrosis affecting cells in the center of the acini, and if in advanced cases there were any normal liver cells remaining they were at the periphery of the lobule. He pointed out this fact as of importance in differentiating acute yellow atrophy from phosphorus poisoning, in which latter the destruction of cells commences at the periphery of the lobule. In discussing this paper Baumgarten agreed with him. Since then Liefmann, working under Albrecht's direction at Frankfort, has reported an early case of acute yellow atrophy in which the periphery of the lobule was degenerated and necrotic, the next zone only infiltrated and the center clear. In the typical case reported by Rudisch and myself, the report of the pathologist, Dr. F. S. Mandlebaum, reads, "Here and there a few liver cells are seen which have escaped the degenerative processes, and these seem to mark the periphery of the lobules." I have found on examining the sections closely in this same case that the areas of most marked necrosis, where there is nothing left but the walls of collapsed capillaries, always occupy the center of the lobule and that the degree of necrosis diminishes from thence to the periphery. There is therefore no uniform rule as to which part of the lobule first becomes necrotic in typical cases of acute yellow atrophy, and the same lack of uniformity appears in the cases showing zonal necrosis. In Stone's case the slight hyaline necrosis is most marked at the periphery of the lobule. In Opie's case which I have mentioned the necrosis involved all the central zone, leaving intact only a narrow peripheral zone of cells. In our cases it is the central and middle or the middle zone alone which is necrotic.

The rapid degeneration and destruction of the parenchyma of the liver is to-day regarded as the essential pathological process in acute yellow atrophy.

As to whether the more important process is one of fatty degeneration or necrosis, there is a divergence of views. The determination of this problem is difficult, because it opens up the whole question of fatty infiltration and degeneration and also because we are not at present absolutely certain as to the normal limits of fat contents of the liver cells. However, the drift of opinion to-day seems to be in the direction of regarding the necrosis as the essential pathological change. Marchand, Meder

and Paltauf favor this view. Liefmann found that the necrotic part gave the same picture as did pieces of liver which were placed in the thermostat, from which he concludes that the process of destruction is one of autolysis. Paltauf also rather inclines to this view. We agree with Meder, however, in assuming that the quantity of fat in some of these cases is so large, to judge by histological study, that its presence must be pathological. And if we accept Ribbert's view and regard the appearance of small drops and vacuoles as warranting us in considering this condition degeneration, then we must ascribe to fatty degeneration an important part in the process in common with cell necrosis. As to the nature of the fat, except in Liefmann's case, nothing has been determined. In Stone's case fatty degeneration occupied by far the greater part of the lobule, and in Opie's cases fatty degeneration is mentioned as an important feature. The same is true of our cases, and we have also drawn attention to the fact that in some places there is evidence of the cells already injured by the slower process of fatty degeneration being destroyed by the more rapid hyaline necrosis. In Case III are described some cells which are enormously swollen and have an appearance of having undergone hydropic degeneration. The same kind of cell was present in a typical case of acute yellow atrophy.

Pieces of the liver of Case II were treated with osmic acid after Marchi's method, and pieces of a liver showing fatty infiltration were treated in the same manner. The liver of fatty infiltration showed the usual characteristic black staining drops, the liver of Case II showed vacuoles whose margins only were stained black, whereas the center remained clear. (Fig. 9.) I am unable at present to interpret the peculiar distribution of the osmium stain in these drops. The necrotic area contained very little black staining substance. In none of my cases was it possible to stain the tissue after Albrecht's method to determine the exact nature of the fatty change.

The histological appearance, therefore, in cases of acute yellow atrophy and the cases of zonal necrosis are the same—necrosis the predominant process, and marked fatty degeneration constantly present. The difference between the two classes of cases is one of degree only. Clinically there is no difference between the cases of typical acute yellow atrophy and these cases of zonal necrosis in pregnancy. There are some prodromata in both groups, such as malaise, vomiting, constipation,

and two cases of zonal necrosis, to my knowledge early complained of pain in the right iliac fossa, as do occasionally cases of acute yellow atrophy. Jaundice may be present early or late in both. It is infrequently absent in typical cases of acute yellow atrophy, and it seems to be more frequently absent in our cases. The later stages in both are marked by a pronounced change for the worse in the general condition and especially in the nervous manifestations. The vomiting continues until finally the "black vomit" supervenes, the tongue is dry, brown, and

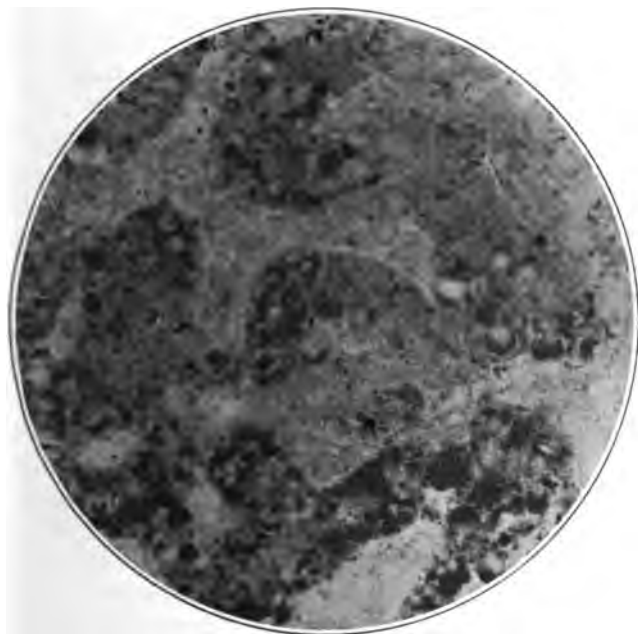


Fig. 9. Liver, Case II ($\times 450$), showing peculiar reaction of fatlike droplets to osmic acid.

cracked, the bowels are constipated or frequent small semi-fluid movements are passed which often contain blood and frequently have a very offensive odor. The pulse may be somewhat slow at first, but usually becomes very rapid, and its rapidity is an ominous sign in cases which have aborted or been delivered. The temperature, as a rule, is never high, except possibly before death or where, as in Case II, it is due to some terminal infection. The nervous symptoms are very marked from the beginning. Severe headache is complained of and is

usually very intense. Sometimes there are hallucinations of sight and hearing. The patients are all very restless and either become somnolent and pass into stupor and finally coma or, what I think is more characteristic and frequent, they become very actively delirious and even maniacal before becoming comatose. In the early stages their mental condition sometimes simulates hysteria and this is a fact to be remembered so that a wrong diagnosis may be guarded against. Paralyses such as Case I showed are unusual. While they are still conscious they complain continually of pain in the epigastrium, which is probably caused by the changes in the liver. Objectively, the liver region may be tender and diminution of liver dullness may be made out, though this is a clinical sign which is very deceiving, since it is often due to the distention of the colon.

Accordingly, we feel justified on etiological, pathological and clinical grounds, in considering cases such as ours to be cases of acute yellow atrophy. If we take into consideration the pathological condition, it may be well to regard them as early stages in the development of a condition which, had the process lasted long enough, would have presented the typical appearance of the liver of acute yellow atrophy. Furthermore, it is our opinion that in many of the cases of pregnancy which develop symptoms pointing to hepatic toxemia, if treated properly at an early period, the zonal necrosis in the liver may be prevented or recovered from and the process need not go on to a fatal termination. For there are cases in the literature such as the one of Bandon and Raymond, which have been diagnosed as acute yellow atrophy, and others which presented the clinical picture of the condition, although not diagnosed as such, which recovered after the uterus had been emptied and other measures instituted to relieve the body of toxic substances.

To be continued.

THE SURGICAL TREATMENT OF RETRODISPLACEMENTS OF THE UTERUS.*

BY

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It has been with no little anxiety concerning my shortcomings as a presiding officer that I have served two terms in the position of honor to which you have elected me. I have probably failed in many things during that period of service, but be assured such failure has never been in the way of due appreciation of the honor and dignity of the office nor the high esteem for the society and for each individual member due them. Nor has it been for lack of conscientious effort to work for the welfare of the society. I have endeavored to enforce the rules the society had adopted for its government, even though not always the most agreeable task I could select. I shall always remember with the deepest gratitude the honor you have done me and the hearty assistance each member has given me in the work. It has been the good fortune of this society to receive excellent scientific information from every Presidential address previous to my elevation, and I regret I have not some discovery or excellent advice to offer you on this occasion. In my topic to-night you will find a subject that has been discussed so many times that one might think it is threadbare and exhausted. However the merits of the situation do not seem to be brought into thorough accord by all those who surgically treat retrodisplacements of the uterus and I have thought consideration of that subject on this occasion might not be illy timed.

In this discussion of the subject I do not propose to consider the questions of whether retrodisplacements require treatment nor whether the treatment should be medical; whether the pessary plus hygienic treatment are all-sufficient or whether they should have no place in the care of such conditions. That no surgical operation is needed for retrodisplacements of the uterus is contended by many. Among those so believing mention might be made of Lucy Waite (*J. Am. Med. Assoc.*, 1905, XLIV, 468-471), who in a paper highly condemnatory of the various surgical pro-

*Address of Retiring President of the Washington Obstetrical and Gynecological Society, read October 6, 1905.

cedures for the relief of such conditions—particularly round ligament operations and ventrosuspension—positively states no surgical treatment is required. The subject of etiology can be entered only so far as deformities and injuries may directly bear upon surgical treatment, and even these will be alluded to but briefly. The title, however, presumes that at least some cases require surgical treatment and this discussion is but a corollary of that proposition.

In considering this subject various writers have referred to the more than fifty different surgical operations devised for the relief of retrodisplacements of the uterus, which is evidence of want of satisfaction of gynecological surgeons from those already planned and practised. I will not say this field has been rigidly searched for a road to fame, but I am sure the fame of the individual is made should he succeed in devising a practical operation that will be proper in all cases. Indeed, I may add that the conditions in various cases differ so widely that such an operation would seem to be as great an impossibility as that of providing an article of food that would be sufficient for every member of the human family.

At the risk of incurring impatience on your part I shall briefly consider the various agents that, acting conjointly, maintain the uterus in its position of constant movement yet fairly well known as one of forward inclination. All the pelvic and abdominal organs covered in part by peritoneum have distinct anatomical positions though endowed with a certain limited degree of mobility. They all have ligamentary supports and none other seems to be so liberally supplied with ligaments as the uterus. None of them has freer mobility than this organ, nor is any one of them obliged, in performing its function, to undergo such marked changes in size and physical force as has the uterus. This consequently means great demands upon the tensile strength of its ligaments. The *broad ligaments* are the strongest pair attached to the uterus. They are attached laterally to the whole length of the organ, save the portio vaginalis, and spread out, as they approach the pelvic wall, to a very noticeable extent, being attached posteriorly all along the lateral wall as far back as the sacral promontory. In front the bony attachment extends well forward, approaching the point under Poupart's ligament through which passes the iliac vessels. Placed as they are they have to resist the intraabdominal pressure which is exerted largely against

their posterior surface. Bishop (*Med. Press and Circ.*, 1902, n.s., LXXIV, 675-678) and a few other writers do not think they have much to do with maintaining the proper position of the uterus at its normal level. With this view I am not in accord, believing that support to the blood vessels, ureter and appendages is not sufficient reason for their being so much larger, proportionately, than the other uterine ligaments. Moreover, their structure and shape are calculated for withstanding resistance. The function of the *round ligaments* seems fairly plain when consideration is given to their uterine attachments at the extreme end of the long axis of the organ, the direction from these points of junction towards the bony attachments, the comparative relaxation noticed in them and their size and structure. Throughout their intra-abdominal extent they are enveloped by peritoneum loosely attached to them and within this envelope they each inscribe the arc of a circle. Being attached at right angles to one pole they exhibit again Nature's economy of tissue in its functional activity by having the strongest possible leverage on this axis for the amount of tissue utilized in their structure. But their proportionately larger amount of involuntary muscle fiber and their mobile attachment throughout the extent of the inscribed arc is evidence of their not being planned for great and lasting resistance. To me it would seem their function is gentle and intermittent resistance to backward displacement of the fundus. This function is probably almost entirely limited to such excursions due to pressure exerted on the uterine body by the bladder while being distended by urine. And even in this they are assisted by contraction of the bladder wall incident to expulsion of the urine from it, and its attachment to the uterus. The next pair to be considered are the *uterosacral* ligaments and the opposition to them made by the *uterovesical* ligaments as well as the functions of both sets acting together makes their consideration together imperative. The uterosacral ligaments are attached to the very lowest part of the supravaginal part of the cervix, and each begins about an inch from the uterine end to spread out into a fan-shaped musculo-tendinous structure that is attached to the first and second sacral segments. Their function is to prevent the supravaginal portion of the cervix from moving too far forward. The *uterovesical* ligaments, attached to the anterior surface of the uterus almost opposite the attachment of the uterosacral ligaments, but slightly nearer the middle of the long uterine axis, consist largely of con-

nective tissue and contain a small amount of muscle fiber. In conjunction with the uterosacral ligaments and supported by the fascia in the vaginal roof, they form a strong diaphragm that gives support to the uterus and controls the position of the portion of the cervix to which it is attached. It can have little influence over the mobility of the free *portio vaginalis*. In the quadruped the uterosacral ligaments are large and important structures, having most influence in maintenance of the position of the uterus. Profs. Dixon and Birmingham (Bishop) describe these ligaments as existing in the human male, attached anteriorly to the bladder base, and they assist materially through the uterus, in retaining the bladder in its normal position. Even Alexander recognized the importance of the uterosacral ligaments, by saying in his "Practical Gynecology," page 61, in speaking of his operation on the round ligaments, "The Hodge, or Hodge and stem, according to the nature of the case, are always introduced just before the operation is commenced. The Hodge should be fairly large, so as to push the cervix well back and relax the posterior uterine ligaments. . . . The stem is removed at the end of the third week. . . . Where there is a weakened perineum, a tendency to cystocele or rectocele, or distinctly relaxed retrosacral ligaments, the perineum must be fortified at the same time that the round ligaments are shortened, or a Hodge's or other pessary, as an inferior support, will require to be permanently worn." Beside the ligamentous supports of the uterus there are other less important matters that aid in maintaining the uterus in its normal position. They are:

1. The angle at which the uterus lies with reference to the vagina.
2. The potentiality of the vaginal canal as opposed to the idea of an actual space beneath the uterus (Bishop).
3. The action of the strong perineal muscles and fascia in maintaining the supporting strength of the vagina and converting an actual canal into a valvular slit in the structures.
4. A postulate balance between intraabdominal pressure and that of the external atmosphere.

In many cases we find extensive complete perineal laceration with cystocele and even rectocele without abnormal position of the uterus. This demonstrates the unimportance of the conditions just mentioned in the maintenance of the normal position of the uterus and very strongly demonstrates this function is imposed

almost, if not quite, entirely upon the ligaments. I cannot accept the view of Penrose, so strenuously advocated in his excellent book on "Diseases of Women," by Watkins and others, that the peritoneal cavity, being a vacuum, holds the uterus in position by suction as soon as any agent tends to depress the organ. If this were true then prolapse of the uterus would not be possible except by destruction of such vacuum by abdominal section or other method of admitting air into the peritoneal cavity, the formation of gases in the intestinal tract or the enlargement of abdominal organs. It is not uncommon to find the uterus in normal position and free of adhesions in cases of large ovarian or other abdominal tumors; nor has descensus or other uterine displacement been noted as a result of opening the peritoneum.

Complications.—It is fairly well agreed that all surgical cases of retrodisplacements have complications. In parenthesis I may add that what seems almost paradoxical is the fact that a considerable proportion of such malpositions are spontaneously cured by pathologic conditions developing during the existence of the malposition. Kleinwächter (*Zeitschr. für Geb. und Gyn.*, Stuttgart, 1905, LIV, No. 1, and abstracted in *J. Am. Med. Assoc.*, XLIV, 1890), in speaking of his 366 cases of uterine retrodisplacement, says that in 41, of them the organ spontaneously returned to normal position without the use of the pessary or any kind of treatment whatever. I would particularly refer to his statement that in 10 others, nearly 3 per cent., the uterus was restored to position by some pathologic process drawing it up into place—a fibromyoma, ovarian cyst, etc. This means that 14 per cent. of his cases of this kind were spontaneously cured. I have seen a few cases cured by the development of uterine fibroids and ovarian tumors, but puerperal cellulitis has particularly impressed me with its incidentally correcting malposition. Perhaps it is an unfortunate application of the old adage, "There is no great loss without some small gain."

Probably the most common complication of retrodisplacements of the uterus is endometritis. It is very common and probably much more frequently follows than antedates the displacement. It therefore has little importance as an etiological factor. It, however, is the complication demanding appropriate treatment, and incidentally some procedure may be employed to remedy the faulty uterine position, more especially, in the application of the sound surgical principle of removing the cause of a pathologic condition

whenever in the treatment such is possible. I would not, however, be understood as favoring, under such conditions, any dangerous procedure for bringing about such correction. Metritis, subinvolution and their accompanying pelvic relaxation may be, as a rule, placed in the same class as endometritis. Inflammatory diseases of the appendages with resulting adhesions, infiltration of the uterosacral ligaments with subsequent relaxation are very common causes of retrodisplacements by pulling the fundus and upper portion of the broad ligaments backward and downward or allowing the cervix to be carried downward and forward. Deep laceration of the cervix destroys the mutual fixed point of attachment of the uterosacral and uterovesical ligaments, allowing the uterus to settle lower in the pelvis and, in a measure, destroying the pelvic diaphragm previously mentioned. If such complications as endometritis, metritis or subinvolution, or any other condition that relaxes the uterine tissues or increases their weight be added, and this commonly occurs, the uterus will be pushed downward and the points of uterine attachment of these ligaments swing downward and apart almost in the line of the arcs of two circles inscribed by radii represented by these ligaments taking their bony attachments as centers. With such sagging comes backward displacement. If the fascia adjacent to the lower portion of the uterosacral ligaments be ruptured, as it often is by the same cause—parturition—then this process is all the more easily executed. In many cases even a less degree of cervical laceration may lead to cystic degeneration with hyperplasia of the portio vaginalis, and this, by its increased weight and pressure against the posterior vaginal wall, tends to force downward and forward the lower pole of the long uterine axis. This may gradually stretch the uterosacral ligaments, or even lead to uterine engorgement or inflammation. Elongation of the cervix, either of the supravaginal or vaginal portions, will produce practically similar results. The presence of tumors in the uterus or appendages may, by dragging or pushing the body of the uterus, depending upon their location, cause it to occupy a position lower and farther backward than normal. Habitual distention of the bladder and rectum, very common conditions due to procrastination, are merely mentioned as causes. They do not require surgical treatment. In a few cases a floating spleen or a horseshoe kidney has crowded the uterus out of its normal position. Even a dilated and prolapsed stomach has had the same baneful influence.

Rarely does a deposit of cicatricial tissue in the broad ligaments contribute to displacement backward. Developmental defects in the attachment of the uterovesical and uterosacral ligaments to the cervix are accountable for many cases of retrodisplacement. particularly is this noticeable in women who have not borne children. It is not uncommon to find the anterior vaginal wall attached one-half or three-fourths of an inch too near the free end of the cervix, and quite tense, even in retroversion; this causes an abnormally strong leverage with pulling forward of the cervix. quite commonly defects in the posterior ligamental attachment to the cervix are found. The uterosacral ligaments are attached abnormally high to the cervix and often stretched to varying degrees. The effect of these defects is to allow the cervix to approach the pubes too closely, and thus throw the fundus posteriorly which, in turn, permits intraabdominal pressure to be exerted on the fundus and later the anterior wall. Besides these faults with the lower ligaments, the utero-sacrals may be torn or badly stretched in childbirth, allowing the cervix to drop toward the introitus vaginæ. Relaxation of the top of the broad ligaments, and even of the round ones, often results from prolapsed and adherent appendages, so common in ancient appendage inflammation. These conditions have led to various operations that will be mentioned under the heading of treatment.

Treatment.—With these points in mind we should be prepared to successfully treat any surgical case of uterine retrodisplacement. It is of the utmost importance to be absolutely familiar with the conditions, pathological and anatomical, in each individual case. Inasmuch as no surgical operation is applicable to every case, the surgeon who excludes from his curriculum some of the procedures that are based upon principles that do not violate laws of function and pathology, and sees no necessity for anything but shortening round ligaments or ventrosuspension, or what not, will necessarily needlessly fail and from misapplication. Many cases will need no preparation on the uterus for the displacement *per se*. Many times diseased and adherent appendages will demand appropriate treatment. This may be, indeed, in a large proportion of cases will be, ablation. The careful observer will find this procedure, properly executed, has remedied the displacement. I will just here warn the pelvic surgeon against the improper application of ligatures in removal of the appendages, to wit, placing them so as to shorten the posterior surface of the broad ligament or to

approximate the distance between the uterine cornua and the sacral promontory. This mistake I have witnessed scores of times. I would suggest that a uterine body, very jagged and bleeding on its posterior aspect after separation of adhesions, as a rule, should be removed if the appendages are sacrificed. The defence of this statement is not, "That it is a useless organ," but that future trouble from new adhesions with the subsequent retroversion, endometritis, etc., is so frequently experienced that it may be confidently expected when this rule is violated. When tumors are plainly the cause of retrodisplacement and are removed, due caution should be exercised to learn whether this operation does not entirely remedy the positional defect. Usually it will do so, and in such event nothing further should be done. A floating spleen should be removed, a stomach that mechanically acts as an etiological factor should receive appropriate treatment, as should a lacerated cervix, endometritis; injuries to the pelvic fascia, subinvolution and cervical hypertrophy in any diameters. The sound principles to employ as guides are to principally address our study and treatment to the existing abnormalities, whether of a congenital or an acquired variety, and to regard the displacement as of secondary importance. If injuries to the natural supports of the uterus have occurred and are plainly the important casual factor, then such repair of them should be made as will restore their functional integrity. Such injury oftentimes takes the form of laceration, but stretching from general weakness, or from inflammatory infiltration, may be the condition found. The uterosacral ligaments may, and often are, stretched by prolonged retroversion from some independent cause—as the presence of a fibroid in the body of the uterus, or elongated cervix, or any of a number of other conditions. When the cause of the displacement is removed the weakened posterior ligaments may still require splicing, though this necessity is rare. When the relative leverage of the anterior and the posterior sets of the ligaments attached to the lower pole is lost, it should be restored. The technique of this procedure I will give in detail, as I deem it very important. If the anterior vaginal wall containing the uterovesical ligaments are attached to the cervix at an abnormally low point, the following dissection is made. By means of an incision paralleling closely the anterior cervical wall the vaginal mucosa is separated for one or two inches. The middle of the anterior flap thus made is divided about one-half inch and the angles thus formed are

dissected back. The uterovesical ligaments are now grasped by a forceps or lifted out of the incision and severed from the uterus. The uterus, which has been held by a vulsellum forceps, is pulled lower and the bladder slightly separated from it. The uterovesical ligaments and the anterior vaginal wall are now sutured to the cervix at a level higher than formerly. The anteroposterior short incision is obliterated in the suturing. Occasionally a very narrow strip of gauze or rubber tissue is inserted in the wound, where it is left for about one day. If the anterior vaginal wall seems to be too short, the cervix is carried well back before sutures are applied and the middle of the anterior flap is held forward. This flap is doubled on itself and sutured, thus changing a transverse open wound into an anteroposterior closed one. Should splicing or other form of shortening the uterosacral ligaments be deemed necessary, it should precede and not follow the procedures just mentioned. I have already described the technique of this operation (*Am. Gyn.*, 1902, I, 35-45, and *J. Am. Med. Assoc.*, 1902, XXXIX, 12-15) and will not reiterate here. The round ligaments very frequently will need to be shortened, a procedure very easy of execution through the incision in the anterior vaginal wall. It requires lengthening the anteroposterior incision one to one and a half inches and, as a rule, extending it also through the peritoneum. A very important matter to be remembered in the after-treatment is to induce the uterine fundus to gravitate toward the symphysis pubes, which I have done by having the patients assume a latero-prone or prone position in bed for ten to fourteen days after the nausea from the anesthetic has passed. It is very necessary to bear in mind that the cervix must be kept well back to prevent retroversion. Retroflexion of the body may occur without anterior displacement of the lower pole of the uterine axis, retroversion, never. Very often, in fact nearly always, judging from my experience, shortening the round ligaments at the same sitting is distinctly advantageous. It is principally of value as the body of the uterus is thus held forward, thereby lessening the tension on the sutures placed in the uterosacral ligaments during the process of healing. The best method of shortening the round ligaments has not been decided. Whether any particular one could be decided upon by a committee composed of every man that has devised an operation for shortening these ligaments seems very improbable. Certainly the committee membership would be large. Some of these

methods have special points of advantage, depending largely upon the size of the ligament and upon the question of invasion of the peritoneal cavity. And yet, in most cases, some complication requires intraperitoneal surgery. Moreover, none of these inventors believe appreciable danger is attached to entrance of the peritoneal cavity, under proper precautions. The size of the ligament does guide one as to whether the structure should be looped by some method like those of Dudley, Mann or Wylie, or drawn taut, as is done by G. H. Noble, Simpson, Ferguson and Alexander. The Alexander operation seems to be very narrowly limited in its application except by modification of some sort, the best of which is probably that of Goldspohn, who opens the peritoneal cavity through the inguinal incisions and treats conditions of the appendages. But this requires two incisions, and, although I have performed it several times, I prefer the median line incision with intraperitoneal rather than inguinal shortening of these ligaments. Besides, a few cases have been reported, two by myself, in which the round ligaments did not enter the inguinal canal. In mine they were attached to the anterior-superior spines. Of the intraperitoneal methods my inclination is for Baldy's operation reported by him in 1903 at Asbury Park (*N. Y. Med. Jour.*, 1903, LXX-VIII, 167-169). I believe shortening of the round ligaments and Jonnesco's operation the only logical surgical procedures for retroflexion. The former is always the simpler and more frequently applicable. The operation of Bissel (*Am. Gyn.*, 1903, I, 24, Cleveland) which is termed "Internal shortening of the round and broad ligaments" and that of Slocum (*Ibid*, III, 38-43), termed "Cuneiform shortening of the broad ligaments," have, I believe, a field of usefulness as they are based upon sound anatomical reasons. However, if the ligamental fault be at the lower end of the uterus they are not indicated, in my judgment. During the past four years I have not performed the ventrosuspension operation. This abandonment of the operation resulted from a few relapses, the belief that it was not based upon sound surgical principles and the fact that a considerable number of cases of subsequent bowel strangulation at the point of attachment to the abdominal wall have ended fatally or that result averted by timely abdominal section. I will not ask you to listen to a recital of the statistics of these various operations as to immediate results, ultimate results, effect upon pregnancy and labor, etc., for to do justice to them would require much time and many figures. And

then figures are easily warped to give expression to ideas their authors did not intend. I will only say in closing:

1. That the complications rather than the uterine displacement furnish the cause for surgical relief.

2. All operations done having in view the correction of uterine retrodisplacements should be based upon the pathologic and anatomic abnormalities of the uterus and adjacent structures.

3. That any operation that changes one dislocation of the uterus into another is illogical, and hence unsurgical.

4. As a rule the largest proportion of cases of retroversion of the uterus that require special operations are best treated by proper procedures upon the round and uterosacral ligaments.

ONE HUNDRED CONSECUTIVE ABDOMINAL SECTIONS, PERFORMED AT THE LEWISHAM HOSPITAL, WITHOUT A DEATH.

BY

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THE cases to be dealt with in this paper are those sections that I have performed at the Lewisham Hospital, from February 1904 to July, 1905.

In glancing over the records of long series of successfully performed sections, I find that Lawson had published a paper on 139 consecutive ovariectomies without a death; Robb, in America, had 114 successful gynecological sections; Moynihan performed gastroenterostomy on 100 subjects with two deaths; Bland Sutton performed 100 abdominal hysterectomies with no deaths; while Treves and others have had some very successful series on operations for the removal of the appendix during the quiescent period. I have, however, not found any record of 100 consecutive cases of general abdominal sections, and I am therefore induced to publish this series.

I shall not deal with many details, for I have already done that in a recent work. I wish chiefly to draw attention to a few very important practical points, which have been observed since the above work was published.

The various operations performed are contained in the following list:

	No. of Cases.
Appendicitis.....	23
Appendicitis and ovaritis.....	2
Appendicitis and salpingitis.....	3
Appendicitis and twisted hydrosalpinx.....	1
Edebohl's operation for floating kidney and removal of appendix.....	1
Pyosalpinx and salpingitis.....	12
Hydrosalpinx.....	3
Ovaritis.....	2
Ovarian cysts.....	5
Ovarian abscess.....	1
Twisted ovarian sarcoma.....	1
Ectopic pregnancy.....	4
Ectopic pregnancy and pyosalpinx.....	1
Hysterectomy for fibroid.....	2
Hysterectomy for fibroid and malignant ovarian tumors...	1
Hysterectomy for metritis and salpingitis.....	1
Myomectomy.....	1
Hysteropexy.....	5
Hydatid cysts of liver.....	2
Enterectomy for intestinal fistula.....	1
Enterectomy for intestinal obstruction.....	2
Intestinal obstruction.....	1
Gastroenterostomy for malignant disease of stomach.....	1
Cholecystotomy.....	3
Cholecystectomy.....	1
Inguinal colotomy for malignant disease of rectum.....	1
Post-operative ventral hernia.....	3
Epigastric hernia.....	1
General purulent peritonitis.....	1
Inguinal section—	
To break down adhesions.....	4
For salpingitis.....	2
For ovarian cysts.....	2
Exploratory—	
Malignant of liver.....	1
Malignant of ovaries.....	1
Malignant of rectum and bladder.....	1
Sarcoma of pelvis.....	1

Dilated stomach.....	I
Small fibroid.....	I

100

Appendicitis.—On casting one's eye down the list, one is struck with the large number of cases of appendicitis—nearly one-third of the whole series—and in addition to these I find that I have operated on eight cases in private during this period. This appears to be a very general experience with all abdominal surgeons now, since appendicitis has come to be recognized as a surgical disease by all properly informed physicians. I must confess that my practice with regard to appendicitis has changed very much during the last few years. I at one time did not advise immediate operation, unless it was obvious that pus was present. Now I think, with few exceptions, that the sooner the operation is performed the better. During the last twelve months in two cases, in private, I operated soon after being called in consultation, and although neither patient had been ill for three days, the appendix had perforated and an abscess was present.

In one of the cases in the above series the patient had all the symptoms of intestinal obstruction; a prompt removal of the inflamed appendix, and the performance of enterotomy saved the patient, in spite of the fact that an attack of asthma caused the stitches to give way and allowed his intestines to escape.

In another case, in which the patient had been treated for some weeks, and then sent to the hospital to be operated on as a last resource, a fecal fistula formed after removing the appendix; this did not close for a month.

I may here mention that during the last twelve years I have lost but two cases after operating for appendicitis. Both cases were sent to the hospital *in extremis*. I merely record this fact as an instance of good fortune, not good surgery, knowing how often cases are sent to other hospitals in a hopeless condition, suffering from appendicitis.

Inguinal Sections.—It will be observed that I have included eight inguinal sections in the above list. In operating in cases of retroflexion of the uterus, I sometimes find that after making traction on the round ligaments the uterus cannot be drawn into a satisfactory position. I am accustomed then to snip through the fascia transversalis and peritoneum, and

insert the index finger through the internal ring, and then with right index finger in the vagina and the left in the abdominal cavity, to break around adhesions, and in some cases draw cystic ovaries up into the inguinal canal, remove portions of the ovary or the tube and return the stump.

Objects of this Paper.—As I have already stated, I desire to bring some new practical points forward with regard to after-treatment; and my second object is to bring home to surgeons the fact that we are not making satisfactory headway in after-treatment. This last statement may, at first, be received with some surprise when the magnificent success of modern section work is recalled. Notwithstanding this, I maintain that the brilliancy of this very success dazzles us and blinds us to the absolute weakness of our position when face to face with the grave post-operative complications. In fact, in some of the most serious complications that occur after the section is performed we are as helpless to-day as were the pioneers of abdominal surgery.

To what, then, is our present success due? The answer to this question is, without doubt, to *prophylaxis*, and I believe that in proportion as we extend the area embraced by prophylaxis, so shall we be more successful in abdominal surgery.

The Preparation of Patients.—As prophylaxis is the keynote of success, the more experience one gains the more inclined is one to pay increased attention to the preparation of the patient.

A recent reviewer of my work on section cases says that I have not made it clear why there should be so much preparation, when it is a well-known fact that many sections are performed successfully with hardly any preliminary preparation. My reply to this is that very little preparation is wanted in many cases, but in order to eliminate *unsuspected* complications, we should insist on a *thorough routine* and examination and preparation in every case operated on. Of course this does not apply to emergency cases.

I have no doubt that young surgeons often "strike a snag" because they neglected to find out the weak organ, which, when called upon during the operation—and afterwards—to respond, fails to do so, and they then realize that a patient's recovery depends, not on the strength of her healthy tissues, but on the power of recuperation of her *weakest* organ.

The care that must be exercised in dealing with some cases may be illustrated by the following examples:

An anemic patient is operated on, and in spite of every care the result is fatal. A second anemic patient has a similar operation and recovers. The surgeon may offer many empirical explanations to account for the fatal result, but his theories crystallize into more certain form when he discovers the fact that the pathologist finds that a low percentage of hemoglobin is a contraindication to the administration of a general anesthetic, and if a severe operation be attempted when the hemoglobin percentage is below 30, death is almost certain to result.

Again, no one should ever perform a section without first testing the patient's urine. Three patients, with a similar lesion, may present themselves and an examination reveals the fact that each has "sugar in the urine." The first patient has only a trace, a section is performed and she recovers. The second has quite a small percentage of sugar and she is operated on and dies after being in a comatose condition. The third case has a very large percentage of sugar and is operated on, and not only recovers, but the sugar disappears from her urine. What is the explanation? For years it has been laid down as a surgical maxim that a patient with diabetes is a bad subject for an operation; and yet, side by side with the first, we have the knowledge that in many cases where the urine is loaded with sugar they have survived the most severe surgical procedure, and the operation has led to the disappearance of the sugar from the urine.

We have arrived at a stage where we have come to recognize the fact that there are many people who have sugar in their urine, and who are apparently free from any discoverable disease; while on the other hand there are those in whom the sugar in the urine is the symptom of some grave disorder. In the one case we operate with impunity; in the other case, to operate spells death. Now the surgeon is not able to distinguish readily between these cases, and he must await the investigations of the physiologist and the chemist for a certain cue to the mystery. The recognition, however, of the grave import of diacetic acid in the urine is a step towards elucidating this complex problem.

I think that no more striking example of the great importance of testing the urine before any operation could be quoted than

the following: Goldspohn in a series of 170 cases of Alexander's operation, in 95 cases of which, in addition, he performed bilateral inguinal celiotomy, lost only one patient, and she died sixty hours after the operation in a diabetic coma. The operator was unaware of the fact that the patient was suffering from diabetes, as the urine of another patient had by mistake been examined for hers!

In one case in the series under consideration the patient was admitted into the Lewisham Hospital in a very anemic condition. She was suffering from a large fibroid of the uterus and two ovarian tumors, and her menorrhagia was truly alarming. I determined to try chloride of calcium and gave her fifteen-grain doses three times a day for three months. She improved somewhat and left the hospital for a time, and then returned looking much better, as the hemorrhage had decreased very much. The uterus and ovarian tumor were removed, and she made a good recovery. To have operated on this woman when she first presented herself would have meant certain failure. I have frequently tried the chloride of calcium in those cases of alarming menorrhagia at the change of life, and the results have been satisfactory.

When a patient presents herself with a fibroid and I contemplate doing an abdominal hysterectomy I always examine her heart, her urine and the veins of her legs. The examination of her heart may reveal that peculiar cardiac degeneration which is often associated with fibroid disease of the uterus; a condition, be it noted, that has not unfrequently led to the sudden death of the patient after the operation has been performed. In fact, I have seen a death on the table when the brilliant Olshausen, of Berlin, was performing hysterectomy, the patient having one of those degenerated hearts. Again, one not infrequently finds very grave disease of the kidneys with such tumors; and lastly, the observations of Weyder and others on the occurrence of embolism after hysterectomy have warned surgeons that if any signs of phlebitis are present that all operative interference should be postponed until the phlebitis is cured. If during the course of the operation thrombosis of the veins of the broad ligament be discovered, the greatest care must be exercised to prevent the patient from exciting herself for many weeks after the operation, for Weyder, Wehman, Buschbeck and others, have all recorded fatal cases of embolism after discovering thrombosed veins in the pelvis during the course of the operation.

Sterilization of the Hands and Ligatures.—Intimately connected with the subject of prophylaxis is the subject of sterilization of the hands, instruments and ligatures; and here again we have been taught the way from the laboratory.

I shall only briefly refer to this subject. I now use a watery solution (1-500) of the Biniodide of mercury. I do not doubt that there are many other solutions as efficient as this for the disinfection of the hands, but I have adopted this one because it does not irritate my hands in the least; for, performing on the average, eight operations every week, I have found that all other solutions cause varying degrees of dermatitis in the clefts of the fingers. This is especially true when the Biniodide is dissolved in spirit.

One conclusion I now have firmly fixed in my mind. I believe that a surgeon may perform sections with success after he has washed his hands with plain water and soap. This fact I have seen demonstrated in the practice of Lawson Tait and Bantock. I even believe that it requires less clean hands to do a section than it does to perform a radical cure of hernia. The peritoneum can take care of itself, up to a point, much better than the tissues comprising the layers of the abdominal wall. On the other hand, I am firmly convinced that no known solution or method is adequate to effectually sterilize hands that have come into contact with certain kinds of septic matter. If I am asked to say what kinds, I should pick out the pus from a stinking appendicular abscess, the uterine discharge from a case of acute puerperal septicemia or the pus from acute osteomyelitis. I have collected some of the surgical tragedies recorded by Tait, Robb and others to illustrate this view, and it is only quite recently that I have brought under my notice the following facts: A most careful and successful surgeon operated on a septic case on the Friday of one week. On the following Monday and Tuesday he operated on three other cases, and all three died rapidly of septic peritonitis. A still more recent example is one in which a surgeon operated on a case of appendicitis, and next day he operated for the radical cure of a hydrocele. Both cases died with tragic rapidity.

The lesson to be learned from this is that while one may be able to cleanse one's hands sufficiently well in the majority of cases to perform sections with success, there are times when no known method is adequate. Accordingly, whenever we are in doubt as to the sterility of our hands we should postpone an

operation for three days or use rubber gloves. I myself find that the beautiful gloves made by the Kny-Scherer Company detract in only a slight degree from one's manipulative power. They must fit the hands closely; if they are loose they are very clumsy.

With regard to ligature, I employ silk and catgut; but I acknowledge the great utility and excellence of Wallaby tendons, which have proved most reliable in the hands of some of my colleagues at Lewisham.

I have tried many methods of sterilizing catgut, but ultimately adopted the Biniodide of mercury method and used it for some years. However, after having used the catgut prepared by Ellwood Lee in over six hundred cases, I now no longer prepare my own catgut; I am quite satisfied with the Lee gut, and I also in all my section cases use the silk prepared by that firm. I do not, however, use Lee's chromic gut, as I find that it is over-prepared; it does not become absorbed, and works out of the wound weeks and months after it is inserted. The real fact is that no suture is of much use after three weeks, consequently if we use chromic gut it should only be very slightly impregnated with that chemical. In the operations on post-operative hernia in this series I employed silver wire in place of chromic gut, and the results were very satisfactory.

Precautions During the Operation.—I shall but briefly refer to a few points that I think of great importance.

(a) *Warmth.*—Shock is one of the worries of section work, therefore any prophylactic measure that may be employed to diminish shock must never be neglected. The more I operate the more particular do I grow with regard to the temperature of the room and the clothing of the patient while on the operating table. The best temperature I find, is a dry heat of 72° F. With regard to clothing, I consider that every patient should have a warm flannel undershirt on, and should be in a flannel night-dress. She should wear warm woolen stockings and in some cases I have loose trousers of cotton wool made for these anemic subjects. The patient should be on a large, flat hot water bag, while over her chest in cold weather I always place a thick layer of cotton wool covered by protective. It is most important that the patient's coverings should not become soaked with fluid during the tapping of cysts or while irrigating the peritoneal cavity, since the body, as Hale White has shown, actually loses

more heat when surrounded by wet clothes than when it has no covering on whatever.

(b) *Pus Tubes*.—Robb remarks that the mortality following operations for suppurative disease of the tubes and ovaries is variously estimated at from 8 to 20 per cent. We all know that the pus in many tubes is sterile, but at times we get pus in tubes that is most virulent, and then such cases are the most fatal of section cases, even among the best operators. Now, if after opening the abdomen an examination discloses the fact that we are dealing with tubes distended with pus, and the history points to the pus being of recent origin, and we find the tubes so adherent that to attempt to remove them means that we must risk the patient's life, then I hold that under these circumstances it behooves us to endeavor to tap such tubes per vaginam and not to attempt to remove them. In past years had I had the sense to follow this practice I am sure that I could have saved lives sacrificed in the vain endeavor to remove the tubes instead of being content to drain them. In this series I was fortunately able to remove all the pus tubes, but one need not feel ashamed to adopt the expedient mentioned when we find such a master of technique as Howard Kelly resorting to it with alacrity.

Again, in operating on cases of appendicitis in women I have sometimes found the appendix adherent to the right broad ligament, and the latter distended with pus. In these cases I remove as much of the appendix as possible and then drain the abscess by way of the vagina.

After Treatment.—A careful consideration of the literature of abdominal section will very soon convince anyone that progress in after-treatment has been very slight when compared with the enormous strides made in prophylaxis. The after-treatment of many section cases is often a very simple matter, but what poor creatures we find ourselves when face to face with some of the complications that follow some of our sections. The very commonest complication that occurs after abdominal operations, *i.e.*, accumulation of gas in the intestines, often defies our efforts and leads to death by pseudo-ileus. If one opens a text-book and seeks for an explanation of tympanites *fater* *coletomy* we are told with smug complacency that tympanites is the result of a temporary paralysis of the bowel due to the manipulation during the course of the operation. When, however, one comes to examine the work that has been done on the

innervation of the bowel, one finds that innumerable experiments have only led to chaos. No two observers agree as to parts that the sympathetic and the vagus play, and even the conciliatory theory of cross-innervation put forth by Ehrmann and Van Basch is now negatived by the experiments of Starling and Bayliss. Here there is only one out of many instances that could be quoted where the surgeon will never be able to explain the most common results that follow an operation until he has sought the aid of the physiologist in his laboratory, and even then he may seek in vain.

But the surgeon, in his empiric way, will often be content to light on a remedy and wait for an explanation of the cause of the trouble. During the last year I have adopted the suggestion that eserine would be of use in tympanites, as it is a well-known fact that physostigmine will cause violent contractions of the unstriated muscles of the body, and will cause actual pain from contraction of the stomach and intestines. I have used the salicylate of eserine in a large number of cases, and with the most gratifying results. I employ the 1-50 gr., hypodermically, and find that the bowel begins to expel the flatus in about twenty minutes. I find that the injection can be repeated in two hours and a third injection may be given. I have not ventured to give more than the three injections in six hours. A good plan is to give the eserine and then wait fifteen minutes, then give an enema of soap and turpentine; or one of sulphate of magnesia, glycerine and hot water. I frequently employ the eserine and the last-named enema after operating on the appendix, but do not inject more than eight ounces. By getting a free passage of flatus I seldom find it necessary to give an aperient (generally castor oil) in these cases before the fourth day, though usually I like to have the bowels open on the second day in ordinary section cases.

Pain.—If the patient is in great pain after a section, how are we to give her relief? There is only one drug—morphine—and I still hold to the view that that drug must be conspicuous by its absence in the after-treatment of section cases. I believe, however, from the perusal of discussions at medical meetings, that operators are inclined to use morphia more freely of late. During the last year I have tried heroin very frequently, and have been rather surprised to find that many of the patients slept almost as well after its injection as after morphia. These, however, have been usually cases where pain has not been very

pronounced. It is a most excellent drug for children, and they sleep very soundly after quite small doses. I have satisfied myself that heroin binds the bowels only in a slight degree, and that the tympanites are not very appreciably increased after its use. I give gr. 1-20 and this may be repeated in an hour—and even a third injection may be given during the first night.

Sleep.—With regard to sleep, heroin gives relief from pain by producing sleep, and this is especially the case when we give veronal beforehand. If then the patient is able to keep down ten grains of veronal, we can generally count on her having a good sleep if an hour after taking the veronal we administer the 1-20 gr. of heroin. I have used veronal in all sorts of cases, and it is proving to be one of the most excellent hypnotics that I have tried. It is very satisfactory when used by rectum. If, however, the patient fails to retain the veronal, and the heroin does not act, I have, as yet, found no means of producing sleep, except by a diminished morphia.

Bowels.—But if we are in want of a drug that may be administered hypodermically to cause sleep and to ease pain—morphia being out of count—how much more do we require one that will act on the bowels, when administered under the skin? So, when such a drug has been discovered, we shall have made a huge stride in the after-treatment of section cases; but at present we are no better off in this respect than we were twenty years ago.

The drug that is most often used as a purgative after section is calomel, but a more vexing and uncertain drug does not exist; so uncertain is it in its action that I frequently give elaterium with it. I employ sulphate of magnesia, when the patient can retain it. But there is one drug that always appears to be regarded with suspicion, and that is Croton oil. Usually, when a surgeon orders Croton oil he begins to look round for the death-certificate book. The reason for this is that the drug is only used in desperate conditions, and at a time when probably no drug would have any effect. A long experience of the use of Croton oil has shown me that it is not anything like the blunderbuss that it is supposed to be. Given in the form of small pills in half-drop doses it acts often like a charm when calomel and other drugs have failed.

Ileus.—Nothing can be more disappointing than after one has operated on a case, and she has got over the difficulty of the first week, and when just ready to leave her bed she is seized

with symptoms of obstruction. At the outset one may be in great doubt as to the diagnosis, and yet it is on an early diagnosis that the success of treatment depends. If we examine a case of ileus we may find that the pulse is only a hundred, the temperature may be normal or subnormal, the tongue clean and moist, and there may be little or no distension of the abdomen. But if such a case is watched, there is one sign that is very characteristic. The patient lies still for five or ten minutes, and is then seized with a violent colicky pain. She may lie with her legs drawn up as she does when suffering from peritonitis, but when the pain seizes her she does not keep still; she will twist and turn, and lie on her side; in fact, wriggle about the bed. Now it is this unrest, these gross movements that make one think of them as opposed to peritonitis.

Once I suspect that a patient is suffering from ileus, I do not hesitate to at once reopen her. If one waits until the vomit becomes dark and contains the small brown particles, one is only allowing the best chance of saving her to pass. Having opened the abdomen, a few distended coils of bowel, with every capillary injected, will present themselves.

I think it is a great mistake to lose much time in searching for the obstruction. All that is required to be done is to open the bowel and drain it, and deal with the obstruction later on. Recently in a case, where a section had been performed by another surgeon a week previously, I reopened the abdomen, fixed the bowel in the wound and drained it for a week. Then I closed it but did not return it. Almost immediately after closing it the symptoms of obstruction returned and the bowel had to be opened again. I drained it for another week, and then introduced some fruit seeds into the opening in the bowel, and an hour after injected a large dose of castor oil through the same fistula. Next day an enema was administered by the rectum and in the motion that resulted some of the fruit seeds were discovered. I accordingly closed the opening in the bowel again, and the patient had no further trouble.

In one of the cases of intestinal obstruction in this series the effect of merely opening and draining the bowel was well shown. The patient, a woman of 30 years, was brought to Lewisham after being refused admittance into two other hospitals. She was at death's door, and was so weak that I put off the operation some hours to see if stimulation would restore her. Finding, however, that she grew worse, I made an opening, not in the

middle line, but close to the cecum and drew out the distended coil of intestine, slipped a pair of artery forceps through the mesentery and opened the bowel. Through the opening there poured out pint after pint of the most malodorous fluid I have ever had to deal with. The bowel was drained for a fortnight and then an endeavor made to close the fistula; this failed, so later on I performed enterostomy and the patient soon after left the hospital. What the cause of the obstruction was I did not discover.

Shock.—Were I asked to name the factors that have dominated abdominal section work up to the present, I should without hesitation say shock and peritonitis.

When we read the pathetic histories of the early operations, and picture to ourselves the patient entering the room, seating herself in an arm-chair, and without any anesthetic submitting to the ordeal of having her belly opened for the surgeon to rake here and there and everywhere among the terrible adhesions, which were the result of innumerable tappings by septic trocars—when we think of such a picture, we cease to wonder that shock played such an important rôle in those fatal days.

The introduction of anesthesia naturally diminished the profound shock that occurred in these first operations; but even now we are often brought face to face with instances of severe shock, and while prophylaxis has been employed to good purpose to prevent complication, still in spite of every precaution one is called upon to treat every degree of shock in dealing with any but the simplest sections.

There was a time when the quick pulse of shock was a subject of absorbing interest to me. As I sat and watched a section case I vainly endeavored to alter by many means that quick pulse. Then the time came when Credé's luminous researches made the matter clearer. That quick pulse, I found then, could not be quickly altered, for no therapeutic measures are capable of altering the profound change that takes place in the condition of the abdominal blood vessels. I know now what I did not then, that the small pulse is not due to any weakness of the heart, but depends on the amount of blood supplied to the right side of that pump; and the other fact that I have learned is the immense importance of having your blood circuit a closed one; a small vessel that keeps on spouting, or a torn vein may turn the balance against the patient.

After many different modes of treatment I finally adopted

the following. I rely, in the first place, on warmth. The patient is surrounded by hot rubber bottles covered with *three* layers of blanket. The end of the bed is raised on four bricks—two on either side. Strychnine is administered hypodermically. I generally give 1-10 grain to start with, and then 1-20 grain after an hour or so, but I never give more than 1-5 grain during the first four hours. I am very sparing with strychnine if the kidneys are at all affected. In cases where blood has been lost I always order from thirty to forty ounces of saline, injecting it over the ribs by the edge of the pectoral muscles. Into the saline I used to put from twenty to sixty drops of the tincture of digitalis, but of late I have been using digitalone hypodermically. I find this a more satisfactory drug, and it causes no unpleasant local results. With regard to brandy I never now employ this until the symptoms of shock are passing off, then an ounce injected into the rectum does some little good by helping to flush the skin. Far superior to brandy is the carbonate of ammonia. Twenty grains of this injected into the rectum in ten ounces of water works wonders. After injecting the saline by the side of the heart I usually give five minims of adrenalin under the skin. After using the drug in many cases during the last two years I cannot speak too highly of it; I have only to utter a warning note for those who give ten to fifteen minims for a dose. I have seen a patient only saved from death, after such a dose, by the prompt administration of nitrite of amyl.

Though I have not used oxygen in the treatment of shock, I am sure that it may be used with great benefit. I always employ artificial respiration for some time after the patient is placed in bed.

In Credé's recent work on blood pressure, he draws attention to the employment of a rubber suit that the patient has fitted to her legs. The object of this suit is to supply, by external pressure, a peripheral resistance; the pressure acting on the venous trunks causes the blood to flow toward the heart. I am sure that this appliance is worthy of a trial.

Peritonitis.—Lastly, I come to consider that condition that will ever remain the *bête noire* of abdominal surgeons—peritonitis.

At the present time, in the presence of grave post-operative peritonitis we are almost helpless. True, we try many things, but what does our trying amount to? We purge, we reopen the abdominal cavity, wash out and drain, and death is the usual result.

It appears to me that physician, as well as surgeon, regard peritonitis as an inflammation of the peritoneum, and that the patient dies on account of the inflammation of the serous structures. When, however, one has seen an autopsy conducted on a case of fulminating peritonitis, one at once realizes how little evidence there is of actual inflammation of the peritoneum in some of the most acute and fatal forms of peritonitis.

Let the abdominal surgeon then regard peritonitis as an affection of the peritoneum that is fatal in proportion to the quality and kind of poison manufactured in the peritoneal cavity. The mere inflammation of the peritoneum has little to do with the fatal result; in fact, often the most favorable cases to deal with are those accompanied by all the signs of inflammation, which should be regarded as the local attempt of the tissues to limit the morbid process.

Now, whether the patient dies slowly or quickly, the patient dies because she is poisoned—her death is due to the absorption of toxic substances. Therefore, if we want to get the mastery of the "fury" of section work, we must attack the trouble locally, in order to check the elaboration of the poison, and we must counteract the effect of the poison that has been absorbed. Now, the latter is the more important of the two, and as post-operative peritonitis is usually caused by one of four species of germ, we must be content to wait until four different kinds of serums have been supplied to us from the laboratory. In the meantime, we must rely on local treatment, and by that I mean irrigation and drainage. But not alone drainage of the peritoneal cavity, but also drainage of the intestinal canal, and therefore I believe that whenever the peritoneal cavity is opened after a section, we should perform enterostomy as part of the routine treatment for peritonitis.

In some cases, finding that the irrigation at the time of the operation was insufficient, I have resorted to the hot bath. In one case—not, however, in the above series—a lad aged 7 years, was brought to the Lewisham Hospital with an abdomen very distended and tympanitic. I opened his abdomen in the middle line and immediately there poured forth pints of pus. I did not attempt to close the incision, but I sewed the parietal peritoneum to the skin edges of the wound and inserted a mattress suture of silkworm gut on either side, so that traction would make the opening gap. While he was on the table I irrigated his peritoneal cavity with gallons of saline, then plugged

the opening with gauze. As he appeared a little better next day I had him placed in a bath of hot boracic water; the gauze was then removed and the wound made to gape by traction on the silk gut, so that the water freely entered his abdominal cavity. This was done every day for a week, and the boy is now a well-grown youth.

In cases of appendicular abscess I get the patients into a bath three or four days after the operation, and it is wonderful how soon the putrid discharge alters.

In cases of hydatid cysts, which suppurate after being fixed to the parietes the hot bath has been employed by me for years with great benefit. The bath may be wheeled to the side of the bed and the patient lifted on to a frame work, and this is let down gradually into the water.

In one of the last cases in the above series, operated on whilst removing a large adherent pyosalpinx, a large piece was taken out of the wall of the rectum. The region was packed with iodoform gauze and the abdominal wound was only partly closed. Four days later the patient was placed on the table and an opening was made in the left inguinal region and the gauze removed and drainage tubes inserted through the media and inguinal openings. The feces and pus poured out of these openings for some weeks, and as soon as the patient's condition would permit, she was placed in a bath every day. She made a good recovery and no fecal fistula remains.

Afterword.—In conclusion, I wish to emphasize what I have already said, that the great results of abdominal surgery are chiefly due to the abdominal prophylactic measures that we all adopt. On the other hand, while the after-treatment of many section cases is a very simple matter, still the treatment of the grave post-operative complications leaves much to be desired. As the gynecologist no longer confines his labors to the pelvis, but works in a wider field, and heals all abdominal lesions, so the time has come when we must recognize the fact that the only manner of making progress is to cease to think that mere clinical observations will explain the cause of many of the phenomena that present themselves to us after an operation. We must seek the aid of the laboratory. As Wannen remarks, in a recent address, "without the laboratory worker's aid, however, the clinician becomes swamped in a mass of clinical detail from which alone he has again and again been unable to extricate himself. There can be little question that the

combination of energies which accomplishes most in surgical progress is that obtained by the cooperation of the laboratory investigation with the surgeon of clinical experience. Too long have these two departments of medicine conducted themselves independently and, as I feel, greatly to the disadvantage of them both."

When, then, the abdominal surgeon has received from the laboratory a drug that will cause sleep and relieve pain without causing constipation and tympanites; when he has in his hands a drug that will purge after hypodermic injection; when he has a proper explanation of tympanites, and lastly, when he has various serums for administration in cases of peritonitis, then, and not till then, will the after-treatment of section cases be in a satisfactory condition.

FIBROMA MOLLUSCUM GRAVIDARUM: A NEW CLINICAL ENTITY.*

BY

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(With plate.)

It is a precarious undertaking, I fully appreciate, to hazard the description of a new clinical entity, so thoroughly has the field of medicine and its specialties been tilled, and so acute has observation become. Nevertheless, the study embodied in this report has been most scrupulously and zealously threshed out, and the search of the literature has been as complete as the facilities afforded by the library of the New York Academy of Medicine, and by several large private libraries, have per-

*Presented to the Obstetrical Section of the New York Academy of Medicine, December, 1905.

mitted. No reference,* even remotely associated with the theme, has been found; and I have been persuaded, almost unwillingly, that this publication is the first to deal with the subject.

The condition which I wish to describe I have named *fibroma molluscum gravidarum*, for the reasons that clinically and pathologically the lesion corresponds with fibroma molluscum as known and described by dermatologists, and that the form discussed in this paper appears only during pregnancy.

The originality of the observation of the appearance of fibroma molluscum in connection with pregnancy I can scarcely claim. In conversation with a number of dermatologists and specialists in obstetrics, I have learned that they too have noted the coincidence of the two conditions; but, like myself, they have supposed that the phenomenon had been recorded. It is but fair to myself, however, to state that this paper is the first, as far as I can learn, to deal with the theme.

The fact that the course and distribution of the fibroma molluscum of pregnancy differ entirely from those of the condition as usually seen marks it as an entity which, while of no great practical use, still has a decided scientific interest. It is of no value as a sign of pregnancy.

Symptoms and Course.—Fibroma molluscum gravidarum differs in no way histologically from the disease when found in males or in non-pregnant women. In its clinical course, however, it departs quite widely from the common type. It first appears, usually, about the fourth or sixth month of pregnancy as small, slightly pigmented or non-pigmented sessile or pedunculated excrescences. These increase slowly in number as the pregnancy advances until, at full term, there may be as many as forty or fifty. Or they may appear in limited number, not increasing or diminishing during the further period

*Several authors (Partridge-Verrier, Shroeder, Braun) mention the appearance of brown chloasmic spots upon the neck, but it is evident that none of these authors are describing the condition herein considered. A few characteristic contributions to skin lesions in pregnancy may here be cited. Allen (*Bos. Med. and Surg. Jour.*, 1851; XLIV, p. 175) speaks of a fine, brownish eruption which he noted in two pregnant women, which was squamous in character, and which covered the entire body. One of them gave birth to a macerated child, the other to twins, one of which was still-born. Oswald (*Brit. Med. Jour.*, 1882, Vol. I, p. 702) narrates the case of a rheumatic woman who, during her pregnancy, had a squamous eruption with the appearance of bullæ on the arms and legs. Squire (*Proc. Royal Med. and Chir. Soc.*, 1864-67, Vol. V, p. 196) discusses the influence of nursing on psoriasis, reporting a case which came under his observation.

of gestation. The previous state of the patient's cutaneous health has no bearing upon the appearance of these fibrous nodules. In one case they developed in a young woman who had formerly suffered from acne, and in another they were accompanied by a molluscum contagiosum. But in the seven other cases which I have observed there was no other accompanying cutaneous lesion nor any history of any previous skin disease.

Within from a few weeks to a few months after delivery the excrescences lose their pigment, assuming the color of the adjacent skin, and gradually disappear. The patients who were the subjects of this observation all had pregnancies which were perfectly normal in every other respect, and all had normal deliveries. The urinalysis showed no abnormalities, and except for the presence of the little excrescences about the neck the patients had no complaint to make.

No symptoms apart from the eruption are observed. There is no pain, nor itching, nor any discomfort. The growths are not sensitive in the slightest degree. The fibrous nodules do not undergo inflammation. As to the pigment, in some instances it was noted that in brunette women in whom the areola and the linea alba were darkly pigmented, the fibrous nodules too, were similarly affected. They were of the color of the surrounding skin, however, in many of the cases. In one recent instance, Mrs. A. J. B., I counted twenty about the neck, of which but six larger ones were darkly pigmented, while the other fourteen were slightly pigmented or were of the color of the surrounding skin. The older the nodules the more likely they are to be pigmented.

Distribution.—The fibromata mollusca are distributed mainly about the neck. They are found on the sides of the neck, and in front of it near the sternoclavicular articulation. They are sometimes seen between the clavicles and the breasts, or under the breasts; and in one instance they were noted on the back as low down as the angle of the scapula. In the distribution, too, the condition differs widely from that of the ordinary fibroma molluscum, the distribution of which is general over the body. In fibroma molluscum gravidarum the distribution is exceedingly limited, and is never seen on the mucous membrane, as is occasionally the case with the ordinary fibroma molluscum. I have never seen it about the joints or on the extremities.

Lesions.—The lesions of fibroma molluscum gravidarum differ from those of the ordinary variety in that they do not attain large size. They vary in size from a pin head to half a split pea. They project above the neighboring skin, are often sessile, or frequently have a small pedicle. They are always multiple, and are not grouped according to any specific arrangement. There may be from ten to forty of the growths. They are usually pigmented, generally yellowish, running to a yellow-brown or dark brown. The smaller ones are digitate, but the larger and older growths resemble, on close inspection, nothing so much as a mulberry—that is, they are what might be called polypoid in character, but they do not look at all like warts, being rather pointed at the extremities. Although the fibromata themselves are, as has been noted, very frequently pigmented, the pedicles of those which are pedunculated are always of the color of the skin.

Until regeneration begins they do not attain the color of the normal skin. Upon their disappearance they leave no trace upon the skin of their former presence, nor is any scar visible. In this respect they differ from the ordinary fibroma molluscum; for when this form undergoes involution it leaves behind an empty little bag of skin which represents the degenerated growth (wrinkled skin).

Etiology.—No doubt the appearance of fibroma molluscum during pregnancy is to be attributed to some disturbance of metabolism. It is well known, for instance, that partial alopecia, impetigo, chloasma, and even severe acne develop not infrequently during gestation; and while it has been impossible for me to secure any definite data on the subject, I do not question that the hyperplasia, of which these fibrous molluscs are the representatives, is of metabolic origin. In a general way, then, I would say that fibroma molluscum gravidarum adds but another to the long list of the metabolic changes which pregnancy can evoke. The best argument in favor of this view is the fact that the lesions spontaneously disappear within a short time after the delivery, and at a time corresponding to the other regenerative processes that follow parturition.

It has long been noted that the ordinary fibroma molluscum appears mainly in persons of limited intellect, and of late this has been connected with deficiency of the thyroid or parathyroid secretion. The disturbance of thyroid secretion



FIG. 1.

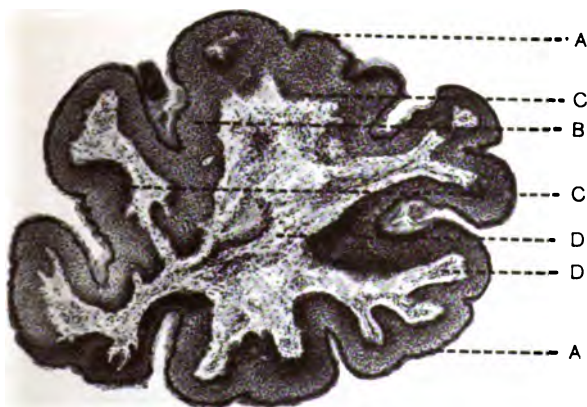


FIG. 2.

MOLLUSCUM GRAVIDARUM—*Brickner.*

FIG. 1—GROSS APPEARANCE.

FIG. 2—PHOTOMICROGRAPH OF CROSS-SECTION.

A—NORMAL SKIN.
B—HYPERTROPHIED PAPILLARY LAYER.
C—DEPOSITS OF PIGMENT.
D—YOUNG CONNECTIVE TISSUE.

during pregnancy has also been the subject of repeated hypothesis, and it is not impossible that the appearance of fibroma molluscum during pregnancy is dependent upon this fact; but I have noted no other general symptoms, such as dryness of the skin, absence of perspiration, rapid fatigue, etc., which would lead me to say positively that the thyroid gland is of etiological importance in this connection.

Diagnosis.—This condition cannot well be mistaken for any of the other well-known cutaneous lesions arising during pregnancy. It may be thought that they might be confused with warts or verrucæ; but I would state that the shape, appearance and consistency of the growths, as well as their peculiar pedunculation, suffice to distinguish them from this ordinary skin disease. The pigmentation, too, differs entirely from that commonly seen in warts, the color being deeper. Pathogenetically, as well as clinically, these two conditions differ from each other, the warts springing from the horny layer of the epidermis, the fibroma molluscum from the papillary layer of the corium.

The disease presents not the slightest similarity in appearance or course, pathologically, anatomically, or in any other feature, to pityriasis versicolor, which at one time, when occurring in pregnancy, was known as pityriasis gravidarum, being so named by Elsasser (Henke's Zeit. 4, 1852; cited in Braun's *Lehrbuch der Geburtshilfe*, 1857, p. 94). Nor, on the other hand, can it ever be confounded with chloasma or lentigo.

The only condition with which the fibroma molluscum of pregnancy could be confused would be with the same condition arising in the non-pregnant state. The differentiation could then be made, of course, from the history, and from the course of the disease.

Prognosis.—The prognosis is absolutely good. The lesions, as has been pointed out, gradually disappear spontaneously within a few months after delivery. The longest period I have seen them last is six months. In one patient, whose neck was literally encircled by the minute growths, they had completely disappeared, without leaving any trace or scar, within five months post-partum. There is no evidence at hand to show that these growths ultimately become malignant. Their tendency is toward disappearance.

Treatment.—The treatment of the condition is evident. No treatment will result in a cure, for the reason that the mollusca

will spontaneously disappear. If, as occurred in one of my cases, the growths are annoying, they may be snipped off with a sharp, curved scissors. When removed in this way, no bleeding follows, the vascular supply being very meager.

Classification and Pathology.—There has been no difficulty in placing this affection in the class of fibromata, and more especially in the group known to dermatologists as fibroma molluscum. It was thus identified clinically, and this recognition has been verified microscopically by my friends, Dr. F. S. Mandlebaum, pathologist to Mount Sinai Hospital, and Dr. S. Pollitzer, the well-known dermatologist, who have both had a very wide experience in the microscopic diagnosis of skin lesions. The accompanying microphotograph shows clearly the histological structure of the growths.

The following histological description of the tumors, of which more than a dozen were examined, was written by Dr. F. S. Mandlebaum:

"The excised tumors are round or oblong in shape, somewhat irregular or papillomatous on the surface, and measure from 1.5 mm. to 3 mm. in their long axis. Sections were cut both transversely and longitudinally, and stained by a large variety of special methods, as well as by the ordinary histological stains.

"When viewed by the low power, the sections appear to have a lightly stained central portion entirely surrounded by normal epidermis, except in some places, where it is slightly thickened and thrown into folds. In some of the sections which were cut longitudinally, a moderate degree of hypertrophy of the prickle-cell layer is noted. The chief feature, however, seems to be a distinct hypertrophy of the papillary layer of the corium. An elongated appearance of the papillæ is noted in places, due to a growth downwards into the corium of the interpapillary processes. With the higher power, the papillary layer shows an increase in the amount of collagenous tissue, the bundles of which are irregularly interlaced, but not closely packed together. In the meshes are numerous connective tissue cells, blood-vessels, and a few lymph spaces. The general appearance of this part of the section is that of a soft fibroma, moderately rich in connective tissue cells. No muscle or nerve fibres can be seen. The base of the tumor at its junction with the normal skin was carefully examined for nerve tissue; but it also was impossible to demonstrate any fibers at this situation.

The blood vessels are rather abundant, most of them being dilated capillaries with thin walls. The connective tissue cells seem rather more numerous in the vicinity of the blood vessels than elsewhere, and occasionally a polynuclear leucocyte is seen, but no evidence of inflammation is observed. Here and there a branching connective tissue cell, filled with minute pigment granules may be seen; only a few atrophic elastic fibers are present, but no mast cells or plasma cells can be found. Hair follicles as well as glands and adipose tissue are absent from the growth.

"The epithelial elements of the epidermis are all well preserved, and quite natural in appearance. The stratum corneum is not apparently thickened, but the layer of prickle-cells in some of the sections shows a slight tendency to proliferation. The cells of this layer in places are rather large, but no mitotic figures are seen. The stratum granulosum is well marked in some places, with abundant keratohyaline granules, while in other situations this layer cannot be distinguished. The basal layer of cylindrical cells is intact, but markedly pigmented. As this layer approaches the normal epidermis at the point of excision, the pigment is no longer seen. None of the pigment granules anywhere in the sections react to the tests for hemosiderin.*

"To classify these tumors properly, a few points must be considered. The chief elements noted are: an absence of hyperkeratosis, a moderate degree of hypertrophy of the prickle-cell layer, an intact basal layer, a hypertrophy of the collagenous tissue with atrophy of the elastic fibers, an increase in cellular elements and blood vessels of the corium, and an absence of nerve fibers. Accordingly the growth can be placed only under the general type of soft fibromata. The ordinary form of hard fibromata, as well as the neurofibromata, do not come into consideration.

"The verrucous growths (warts) are also excluded on account of the absence of hyperkeratosis. The tumors, therefore are soft fibromata, and come under the group of fibroma molluscum."

Recapitulation.—Fibroma molluscum gravidarum is a lesion

*Jeannin states that the pigmentation of chloasma represents a reflex melanosis (*Gazette Hebdom. de Médecine et de Chirurgie*, 1868, Vol. V, p. 278), while von Winckel says positively that it is not the result of a hemolytic process ("Handbuch der Geburtshilfe," Wiesbaden, 1905).

of the skin appearing in the latter half of pregnancy, bearing the histological characters of fibroma molluscum, but differing from it clinically in its total disappearance post-partum at a time when the other regenerative processes are being completed. Its distribution is limited to the neck, the breasts and the submammary area. The lesions are frequently pigmented; but this is not always the case and is not an essential element of the condition. The pigment runs from a light yellowish brown to a dark brown. The disease forms a clinical entity, hitherto undescribed, whose essential elements are the appearance of fibrous mollusca during pregnancy and their vanishing post-partum. Pathologically, the growths belong to the group of fibroma molluscum.

I wish to acknowledge my indebtedness to Dr. F. S. Mandlebaum for making the sections and the excellent microphotograph, and to Dr. S. Pollitzer for his assistance in making the identification of the disease complete.

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Dermatological literature has been consulted as follows: Hebra, Besnier-Doyon, Tilbury Fox, Crocker, Jarisch, Stelwagon, Joseph, Kaposi, Mracek, Hyde and Montgomery, Lang, Malcolm Morris, Shoemaker, American Text-Book (Bangs and Hardaway) Schamberg, von Harlingen, and the files of the *Monatsheft für Dermatologie* as well as many reprints and special articles, including von Recklinghausen's contribution to Virchow's Festschrift (1882) "Ueber die multiplen Fibrome der Haut und ihre Beziehung zu den multiplen Neuomen" (this article is cited by all dermatologists who write on fibroma molluscum), and Hebra's article on skin lesions in pregnancy which appeared in the *Wiener klinische Wochenschrift*, 1872, vol. 22, pp. 1197-1201. This paper has been the basis of most subsequent contributions on the dermatoses of pregnancy and includes a consideration of chloasma, folliculitis, acne, eczema, pruritis, the erythemata, pemphigus, impetigo herpetiformis and pigmentation.

The pathological reference list includes all the standard works on general pathological histology, and the special works, such as McLeod, Unna, Orth, and Ribbert, as well as some recent work on fibroma molluscum, such as that of Noyes: "Histopathology of Molluscum Fibrosum." *Journ. Pathol. and Bacteriology*, Vol. IX., p. 240.

136 WEST EIGHTY-FIFTH STREET.

REMARKS ON THE DERMATOSES OF PREGNANCY.*

BY

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WHEN we consider that there is no disease of the skin which occurs exclusively under the influence of the pregnant state, no single disease of the skin occurring during pregnancy that does not also occur in the non-pregnant, it might seem that we are not justified in using the phrase "the dermatoses of pregnancy" as of a distinct etiological group, however proper it might be to speak of the dermatoses that occur during pregnancy. When we recall, however, that the skin is a part of the organism as a whole, and that like every tissue of the body it must be influenced by the profound metabolic, vascular, and nervous changes incident to pregnancy, and when we bear in mind the results of clinical observation on the intimate relations between

*Read before the Section on Obstetrics, New York Academy of Medicine, December 29, 1905.

the pregnant state and the development of many skin diseases we feel warranted in using the term.

We must include among the dermatoses of pregnancy (1) those diseases of the skin which occur in a preponderating number of cases during the pregnant state, e. g., impetigo herpetiformis; (2) those whose intimate connection with pregnancy is manifest from the fact that they disappear with the evacuation of the uterine contents, e. g. herpes gestationis, chloasma; and (3) those transitory reflex, vascular and nervous dermatoses like urticaria, erythema, etc., of which we can say that they are found with relative frequency in pregnant women not subject to them during the non-pregnant state, that they cease with the termination of pregnancy, and that their pathological character affords some justification for assuming a relation to the pregnant state. Finally, we have to consider the effect of pregnancy on pre-existing dermatoses, like acne, eczema, psoriasis.

Now, gentlemen, these various cutaneous disorders of pregnancy are so familiar to all of you that I shall not obtrude upon this audience any detailed description of them, but shall confine my remarks to a few of the more important considerations.

Impetigo herpetiformis constitutes happily one of the rarest as it is one of the most formidable of dermatoses. Four out of the first five cases reported by Hebra in 1872, all of them in pregnant women, terminated fatally. Since that time a total of about twenty cases has been recorded, and while the high percentage of deaths has been maintained there has been observed an increasing number of cases in the non-pregnant and not less than three well authenticated cases in the male. It is an open question whether, when we have a record of say two hundred cases instead of twenty, we shall include the disease among the dermatoses of pregnancy. It must be admitted, however, that a record of nearly seventy-five per cent. of cases developing during pregnancy implies, even for the limited number of observations, something more than a mere coincidence. Nevertheless there is nothing known in the pathology of the disease, which bears all the marks of a systemic affection, to indicate a dependence on the pregnant state.

Herpes gestationis is a subdivision of that group dermatitis herpetiformis, which the genius of our foremost dermatologist, Prof. Duhring of Philadelphia, succeeded in establishing as a clinical entity out of the horde of erythematous, vesicular, bullous and multiform pruritic conditions which had been described

from time to time under a variety of names. The disease as it occurs in pregnant women differs from the general group to which it belongs only in this respect—that it disappears as a rule within a few weeks after the termination of pregnancy, whether at term or at any earlier period. The condition is fortunately a rare one; I have myself seen only four cases. In one of them the poor woman was so reduced by the effects of the constant itching and the pain and discomfort from ruptured pemphigoid blebs that interruption of the pregnancy was indicated. The disease sometimes recurs with each succeeding pregnancy, sometimes develops but once.

The larger group of Duhring's disease, of which the form under consideration is a subdivision, occurs on the whole perhaps more frequently in men than in women. A reasonable view of its pathogeny is that it is due to a toxemic condition acting on the skin through the intervention of the peripheral nerves. We do not know on what this toxemia depends. On the hypothesis that the toxic agent is generated in the intestinal canal I have treated several cases by a course of Carlsbad salts with good results. But this assumption could scarcely apply to the cases peculiar to the gravid and in them we must limit our therapeutic efforts to external soothing and protective measures.

You are all familiar with the deposits of pigment in the skin that occur during pregnancy. The increase of pigment in the areola mammæ and in the linea alba belong to the common signs of pregnancy. Hardly less frequent is a slight increase in pigment in the upper part of the face. When this pigmentation is sufficiently intense to be a striking feature we call the condition *chloasma gravidarum*. There can be no doubt that the *chloasma* is due directly to changes in the system brought about by the altered state of the uterus, for we find a condition wholly indistinguishable from *chloasma gravidarum* in various pathological conditions of the non-gravid uterus, but we call the pigmentation then *chloasma uterinum*, and the latter differs from the gravid form only in its greater persistence. We may possibly account for the pigmentation of the areola and the linea alba by local physiological changes in the circulation, but this explanation cannot apply to *chloasma* affecting, for instance, the face, and we are forced to assume here some more indirect cause that may be sought in the interference of the gravid or the displaced uterus with the nerves or vessels of the abdomen. I shall return to this point later.

In this group of dermatoses coincident with and dependent on the gravid state we may place the affection to which Dr. Brickner has called attention this evening, fibroma molluscum gravidarum. The condition is by no means rare. We have all seen the little tabs of skin that occur singly or multiple on the neck and upper part of the trunk of adults, especially after the fourth decade of life, and I have myself noted the greater tendency to their development during pregnancy. Aside from the slight disfigurement the condition is of no clinical importance, and to me its chief interest lies in its pathological significance. Permit me to call your attention for a moment to a grave disorder of the skin to which it was my good fortune first to call attention in 1890, acanthosis nigricans. In this disease we have a papillary and pigmentary dystrophy of a far greater intensity than anything seen in chloasma or in fibroma molluscum. In the sixteen years since the disease was first described about thirty cases have been recorded. Now it is a striking fact that in the great majority of these cases cancer in the organs of the pelvis or the abdominal cavity was noted. It seems reasonable to suppose that the changes in the skin in this disease are the effect of interference with the functions of the great ganglia of the abdomen, perhaps with the vascular supply or the nerves of the adrenal bodies. If this view is correct it sheds some light on the occurrence of the pigmentations and the papillary proliferations of pregnancy.

Finally we have to consider the cutaneous effects of the gravid uterus which are of purely mechanical origin, the oedema of the vulva and the venous stasis in the lower extremities. These conditions are of importance from the dermatologist's point of view only through their secondary effects. They frequently occasion a pruritus which, in turn, may be the starting point of an eczema. They disappear with the disappearance of the uterine tumor, but their secondary effects may, of course, persist for a long time.

We come now to a consideration of the transient neurovascular affections of the skin, the urticaria, the erythemata, etc., of pregnancy. At first glance the connection between these affections and an existing pregnancy may seem merely one of coincidence. Urticaria is so common an affection at all times that we might well hesitate to associate it in a casual connection with the pregnant state. But the weight of clinical evidence is nevertheless in favor of such a connection. You gentlemen

know better than I, how frequently urticaria and pruritic erythemata are seen in the gravid, for these conditions are only exceptionally brought to the dermatologist; but I am sure you can all recall numerous cases of this kind among your obstetrical patients; and from them you have heard repeatedly that they have never had the dermatosis before or that they have had it only during a previous pregnancy. And you will often have found that the affection continues with perhaps slight remissions throughout the entire course of the pregnancy, ceasing only with the delivery of the fetus. It is difficult to account for these conditions. Both urticaria and these erythemata are commonly attributable to the presence in the circulating blood of some toxic or irritating substance, in most cases absorbed from the gastrointestinal tract. Whether the presence of the uterine tumor mechanically favors the occurrence of abnormal fermentative changes in the intestines, or whether the noxious agent is the product of some faulty metabolism, maternal or fetal, must remain an open question.

The circumscribed hyperidroses, particularly the hyperidrosis of the palms often noted in pregnant women, are equally difficult to account for. Something may be said in favor of the view that we are dealing here with metabolic products that act directly on the sudoriparous apparatus; but it seems more probable that the cause of these hyperidroses may be found in the disturbance of the vascular balance incident to pregnancy.

When we come to a consideration of the relation of the pregnant state to acne, eczema, psoriasis, etc., we open up at once the question of the pathogenesis of these diseases. Those who believe that these dermatoses are the expression of a dyscratic general state, those who believe them to depend on some diathesis, will have little difficulty in extending their faith to include pregnancy among the causes of the cutaneous disease. But those who believe, as I do, that eczema and acne are infectious diseases, will not admit that the pregnant state as such can have any causative influence in their development. On the other hand, it is clear that an eczema of the lower extremities, for instance, may be unfavorably influenced by an intercurrent pregnancy, and that the circulatory changes incident to that condition may exert an influence on an existing acne. Furthermore, both these diseases are frequently present in so mild a degree—a slight circumscribed thickening of the skin with possibly no subjective symptoms, or a few unnoticed “black-

heads" with only an occasional pustule—that the patient is quite unaware of their existence. If then there is a lighting up of a smouldering eczematous process or an acne under the altered circulatory conditions of pregnancy the case cannot properly be regarded as one of eczema or of acne due to pregnancy. I should explain in this way the cases noted especially in the older literature of eczemas recurring regularly with each pregnancy. Some of these cases were probably not eczema at all, but possibly dermatitis herpetiformis and some were simply exacerbations of old eczematous processes.

As to the etiology of psoriasis we have half a dozen equally unsatisfactory hypotheses to choose from. We do not know what causes psoriasis; but we may be sure that pregnancy is without influence on the disease, for we find that during that condition psoriasis sometimes gets well and sometimes grows worse, just as it is in the habit of doing in the course of any other period of nine months.

In conclusion, Mr. Chairman and gentlemen, permit me to say that I might perhaps have occupied the time allotted to me in a more entertaining manner. I might have confined myself to a narration of the more or less amusing accounts of the lady who recognized her recurring pregnancies by the darker hue which a pigmented mole on her left forearm assumed soon after each conception; or I might have discussed the case of the French lady whose catamenia suddenly ceased when she was threatened with death by a Paris mob during the Terror, and who soon after found herself growing black "like a negro" throughout the entire cutaneous surface, a condition which persisted till her death at the age of 70; and so forth. But I have purposely avoided these marvelous instances in the hope that a calm and rational discussion of the more general aspects of the subject might be of greater service.

64 EAST FIFTY-EIGHTH STREET.

ABDOMINAL PREGNANCY, PERSISTING BEYOND THE NORMAL PERIOD OF GESTATION, WITH REPORT OF CASES.*

BY

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It is my object to present the subject of extrauterine pregnancy with abdominal gestation extending beyond term by giving the history of three cases in my own practice, and a résumé of some recent cases from the literature of the subject.

CASE I. *Extrauterine pregnancy, with extraperitoneal development of gestation; fifteen months' duration; operation by marsupialization; recovery.*—Bertha M., age 30, married, was admitted to the Cincinnati Hospital February 18, 1900, complaining of uterine hemorrhage. Family history negative. Menstruation began at 13 and was normal until two years after marriage, eight years ago. It then became painful and was slightly irregular. She had never conceived, although she would sometimes miss her flow for three or four months, after which it would recur without hemorrhage or other extraordinary symptom.

Previous History.—She had menstruated early in January, 1899. In May, 1900, after carrying a bucket of water upstairs, she was seized with great pain in the abdomen and fainted. She was carried to another hospital, where she remained under treatment for three weeks for pelvic peritonitis. She felt very well after her dismissal at that time, but noticed a lump in the lower part of the abdomen. This continued to increase in size until November 7, 1899, when, having no other sign of pregnancy, and being in doubt about her condition, she came to the Cincinnati Hospital for diagnosis. As the fetal heart could be readily heard, and as there were no extraordinary symptoms present, she was informed that she was pregnant, and was placed on the waiting list for delivery. She, however, insisted upon going home, and accordingly passed from observation.

*Read at the Eighteenth Annual Meeting of the American Association of Obstetricians and Gynecologists, at New York, September 19-24, 1905.

Present Condition.—When she returned, on February 18, 1900, patient stated that she had had several slight attacks of hemorrhage from the uterus, one of which had brought her back to the institution. She said, furthermore, that the abdominal enlargement had been receding, which, from inspection, seemed to be true. No fetal sound could be heard. The tumor at this time was lying rather to the right side of the abdomen, with a marked protrusion just below the level of the umbilicus. It was narrow and irregular, extending upward to the left, the top of the mass being felt half way between the umbilicus and the ensiform. Although tense, it seemed slightly fluctuating. Definite outlines could not be made out readily, although the mass seemed more nodular near the base.

Temperature, 102.5 degrees F.; pulse, 100 and feeble; blood: reds, 3,500,000, whites, 7,500; hemoglobin, 75 per cent.

Operation, February 20, 1900.—The incision from the umbilicus to the symphysis, was carried down to the sac, from which a large quantity of chocolate-colored fluid was taken. The fetus was then revealed, with its head lying in the right iliac fossa, and with its surface presenting extensive sphacelated areas. On removal, it was found to weigh eight and three-quarter pounds. The cranial bones had collapsed and the costosternal articulations had disintegrated. The placenta, which was implanted on the visceral side of the sac, was brown, destitute of any appearance of bloodvessels and looked like a deposit of desiccated and subsequently macerated bundles of connective tissue. An attempt was made to separate this structure from the sac, care being taken not to open the peritoneal cavity, but the effort was only partially successful, as hemorrhagic areas were soon encountered, after which the remnant of placenta was left *in situ*. A few approximation sutures were inserted in either angle of the incision, the wound being left open for a distance of about $3\frac{1}{2}$ inches. Through this opening the cavity was packed with sterilized gauze, and the patient returned to bed in good condition.

After-treatment.—Pulse and temperature speedily became normal. The bowels moved on the second day. The cavity was irrigated twice daily, at which time such fragments of the placenta as could be cut away were removed. To facilitate the more rapid disintegration of the placental structure, the gauze packing was saturated with a strong solution of sodium bicarbonate. Later, however, that is at the end of a few days,

this was discontinued and, instead, a thin paste, containing the yeast ferment, was inserted, with the result that every remaining fragment of dead placental tissue was literally digested away in the course of sixty hours. From this time on the discharge, which had been copious and very fetid, became scant and odorless. On March 20, the cavity would scarcely admit the tip of the little finger; on the 29th, the record indicates that it had closed. On April 6, the patient was permitted to leave her bed.

CASE II. *Extrauterine pregnancy; extraperitoneal development of gestation; eleven months' duration; operation, recovery.*—Lucy W., age 30, married, was admitted to the Cincinnati Hospital June 24, 1903, complaining of being in the family way with failure to feel life during the last three months. Her family and personal history were without significance. Menstruation which began at 15 had always been regular and painless, generally lasting three days, the last having been in November, 1902. Has had four children, all living and well; labors normal; no other conceptions. Her general health has always been good.

Previous History.—Fetal movements were first felt the last of February or the first of March, 1903, the greatest activity having been experienced in the right upper quadrant of the abdomen. These movements were last felt about the 15th of the ensuing April. The abdomen, however, continued to enlarge until early in May, since which time it had diminished in size. She has had no vaginal discharge. A week before admission she had chills followed by fever and copious sweats, recurring at irregular intervals and for which she had been treated on the outside for malaria. This was associated with loss of appetite and occasional vomiting. Her bowels become loose, stools being very offensive. Her face was dull and lifeless, while her scleræ were yellowish. The tumor extended from near the ensiform to the pubes and elicited resonance above, fluctuation near the umbilicus with dulness lower down. The cervix was short, softened, and the seat of bluish congestion. The temperature varied from 99 degrees to 104 degrees F.; the pulse from 70 to 124 and the respiration from 22 to 28 during the week that the patient was held under observation with the hope of improving the general condition. This was accomplished to a certain degree, although the pulse at the time of the operation was 120 and the temperature 102.4 degrees F.

Operation, July 1, 1903.—An incision was made from the umbilicus to the pubes, the peritoneum being opened to that extent. The fetal sac was found to occupy the abdominal cavity, having developed back of the peritoneum and to the right of the uterus.

As a consequence the uterus, with both round ligaments and both Fallopian tubes visible was presenting in front and to the left of the mass. This, after duly protecting the peritoneal cavity with gauze packs, was opened, liberating a large quantity of dirty, cloudy, brownish yellow fluid. The child, apparently fully developed, but with its epidermis macerated and, in certain areas, exfoliated, was seized and removed. The site of the placental attachment was extensive, occupying the posterior abdominopelvic wall to a point nearly two inches above the lumbosacral articulation and occupying the posterior part of the sac wall proper. The attachment to the wall of the sac could be separated easily and without hemorrhage, but an attempt to pull it off the abdominopelvic wall was followed by free bleeding. The sac, placenta and all, was, therefore, drawn through the abdominal incision, and so much of it as was free was excised on a level with the integument. The edge of the remnant of the sac was then stitched to the edge of the skin, to the extent of about four inches on both sides of the lower end of the incision, which was thereupon closed from this point to its upper angle, thus completely isolating the fetal from the peritoneal cavity. An opening was now made into the vault of the vagina, and through-and-through drainage established by the use of gauze. The patient was then put to bed with pulse at 136 and of poor tension, and temperature 99.2 degrees F. Strychnia gr. 1-30 was given.

After-treatment.—The patient reacted well under an intravenous infusion with a hypodermatic injection of strychnia. Gauze packing was changed daily, the cavity being irrigated with normal salt solution. On the fourth day a T-shaped rubber drainage tube was passed through cavity into the vagina and left *in situ*. The gauze packings were saturated with enzymol and changed every six hours. The discharge with offensive odor still persisting, the yeast ferment was placed in the cavity. Under its influence the débris was thrown off with great rapidity, all odor ceased after forty-eight hours, and on the third day of its use a healthy granulating surface appeared on the bottom of the cavity. From this time on the patient's convalescence

was uneventful and she was discharged at the end of the fifth week. As the child was apparently at full term, and as it had been dead for over two months, the period of gestation is estimated at eleven months plus.

CASE III.—*Abdominal pregnancy of four years and nine months' standing, complicated with fibroid of the uterus; extraperitoneal development of gestation; operation; recovery.*

Mrs. K., of Dayton, O., aged 35, married sixteen years, was never pregnant until January, 1900. A month later she had an attack of left pelvic pain, followed by swelling of the left leg, from which she recovered after several weeks of illness. Fetal movements were diagnosticated in June following, and continued until September. They then ceased, but their cessation was marked by an attack of vomiting, and later, in October, when, having attained the size and shape of a woman at full term, she was seized with a slight flow and regular labor pains, which lasted three days. The pain then died away without having effected parturition. She at once improved in appetite and strength, and the whole tumor began to decrease in size. Drs. W. J. and D. B. Conklin, who were then called in, diagnosticated abdominal pregnancy, complicated with fibroids and advised delay before operating, the object being to secure, at least, partial absorption of the placenta before opening the sac. This advice was accepted and the patient, when menstruation was resumed, in December, 1901, did very well until March, 1903. Her menstruation then ceased, and she began to have severe pain in the pregnant site, the dimensions of which had materially diminished. Dr. Conklin's advice to submit to operation was not acted upon, in the hope of forming innocuous lithopedian. In June, 1904, the patient manifested a low grade of septic symptoms, which continued until October 28, when I saw her, and when she reluctantly submitted to the operation of marsupialization. The sac was opened three inches to the left of the median line, and the fetal remnants were removed. They were subsequently shown to the Cincinnati Academy of Medicine, and consisted of the skull bones, the ribs, the vertebræ and the long bones, all skin, flesh and epiphyses having disappeared. There was not a remnant of the placenta left, the partial absorption of which I have observed in two previous cases—a fact which confirmed the wisdom of the early delay advised by her medical attendant. Two large fibrous nodules of the

uterus could be felt through the wall of the sac, the peritoneal wall of which was not opened. The cavity was packed with antiseptic gauze and the patient returned to bed. Two days later the septum between the cavity and the sigmoid gave way, with a resulting fecal fistula. This was permitted to discharge quite freely until the cavity was considerably contracted, when further fecal discharge was controlled by a device suggested and successfully used by Dr. Dandridge, consisting of a layer of rubber dam, on which a rubber sponge is placed and held in position by elastic straps. It now seems that, with the exception of the fibroids, which are not active, the patient whose condition is excellent, will require no further operation.

Additional Cases.—Without any attempt at a systematic research, I have taken from recent literature first at hand, brief records of additional cases which seem to be illustrative of other phases of this general subject, as follows:

CASE IV.—*Extrauterine pregnancy of nearly fourteen years' standing; intraperitoneal development of gestation; operation; recovery.*

Murphy (J. B.) reports (*Annals of Surgery*, Vol. XXXIX, p. 465) a case in which the fetus had evidently escaped through a rent in the tube directly into the peritoneal cavity. The tube had healed, the fetus surviving until the seventh month, by placental connections established within the peritoneal cavity. The operation was done thirteen years later, when he found "no adhesions of the intestines." Adhesions were present between omentum and lower extremities of the fetus to a little above the knees. These were organic and the feet were partially absorbed. The adhesions were ligated and cut off. There was no evidence of a gestation sac, except the thin parchment membrane, chiefly comprising the fetus. This was so firm as to hold the parts in close compression, thin and firm as a drawn hood; the arms were folded on the chest, the head flexed on the right shoulder, and the chin adherent to the shoulder. The fingers were perfectly preserved and mummified. No evidence of any connection between the fetus and any of the pelvic organs. The patient recovered.

CASE V.—*Extrauterine gestation of nearly eight years' standing; intraperitoneal development of fetus; operation; death.*

E. Hurry Fenwick reports (*British Medical Journal*, Dec. 31, 1904) the case of a patient, aged forty-five, who entered

the London Hospital, presenting a large abdominal tumor, associated with fecal urine, pneumaturia, hectic temperature of long duration, great emaciation and chachexia. She had considered herself pregnant eight years before, and had arranged for her confinement when, suddenly, the symptoms of pregnancy began to subside. The abdominal swelling subsided only slightly, and during the seven succeeding years she had a lump in her right side which remained after her belly had otherwise gone down. Three months before admission she had received a blow on this lump, which was followed by pain and sickness, which finally brought her to the hospital. Incision through the abdominal wall revealed a large cavity distended with pus, feces, gas and detritus. When these were washed away the macerated remnants of a fetus were found in the bottom of the sac and removed. "I then," says Dr. Fenwick, "tried to open the peritoneal cavity at the sides, in order to dissect out the wall of the sac in which the fetus had been, but the bowels were not only adherent to it but so greatly softened that I desisted. Finally I was forced to pack the big cavity of the sac. The patient rallied, but died in a few hours."

CASE VI.—*Extrauterine, or more properly, ectopic pregnancy of twelve months' duration; cornual development of gestation; operation; recovery.*

T. Smith and H. Williamson (*Four. of Obst. and Gyn. of the British Empire*, January, 1903) report a case of ectopic gestation, advancing to full term without rupture. She had advanced to full term and labor pains set in; fetal heart sounds could be heard and movements felt, but the position of the fetus was not made out. The cervix was long and firm, and the external os small. The pains were slight and continued so for a week, when fetal sounds could no longer be heard, and the movements ceased. A brown watery discharge from the vagina began, and the abdomen diminished. An operation was done three months later, when a fetal sac was revealed, containing a well-developed child. The pregnancy was regarded as cornual rather than tubal, on the following grounds: (1) The round and ovarian ligaments were attached to the base of the tumor; (2) the abdominal ostium of the tube was patulous; (3) the sac wall was highly developed, containing both fibrous and muscle tissue; (4) the fact that the sac had ruptured at no time in the history of the case. Recovery.

CASE VII.—*Extrauterine gestation of fifteen months' duration; locus of development, relative to the peritoneum undetermined; operation by cystotomy and drainage; recovery.*

Galeazzi (*Gion dell R. Accad. di Med. Torino*, January, 1903) records the case of a woman, aet. 39, who first menstruated at 15, married at 22 and had a child a year later. Menstruation reappeared fourteen months later and continued regular. At 31 menstruation ceased for three months accompanied by all the signs of pregnancy. At the end of three months she was seized with sudden and severe pain in the lower abdomen, which lasted for 12 hours and was followed by metrorrhagia for eight days. A certain amount of indefinite pain remained in the suprapubic region until a year later bladder symptoms set in, necessitating a suprapubic cystotomy, when a considerable number of fetal remains were removed from a cavity that communicated directly with the bladder. Some twenty or more bones were recognized corresponding in size with those of a three-months' fetus. The after-history was satisfactory. The author has collected the histories of 20 similar cases.

CASES VIII, IX, X.—*Extrauterine gestation of duration beyond period of normal pregnancy; intrapritoreal development of gestation; operation; results not given.*

Amann (*L'Obstetrique*, July, 1903) recently exhibited three specimens of fetal remains taken from old and recent extrauterine pregnancies. (1) The first was a full-term extrauterine fetus which had remained in the abdominal cavity for five years. It was rolled into a ball and showed several malformations. Its cyst wall was calcified, and its tissues were in parts full of lime salts—conditions incident to a forming lithopedion. (2) The second was a five-months' fetus, with no cyst walls or membranes, that had been nine years in the abdominal cavity, the fetus being completely calcified. (3) The third was a fetus nearly at term which was malformed, and which had been removed from an extreme hydramnion. The fetus had died only two months previously, yet its membranes were already impregnated with deposits of lime salts. The head and extremities were adherent to the membranes through which the hair of the fetal scalp had grown. The corresponding Fallopian tube showed nodular inflammation of the isthmus.

In addition to the foregoing, I find that Deletrez reported to the French Congress of Gynecology and Obstetrics for last year

a case of extrauterine pregnancy of twelve months standing, and that Saint-Jacques and Marien recently reported (*Union Med. du Canada*) an extrauterine pregnancy of the chronic variety with lithopedion. A case operated upon by Gouberer and reported by Thomsen (*Jour. d'Obstet. et de Gynecol. Russe*, 1903) as a case of extrauterine pregnancy at term operated upon three years after the death of the fetus does not seem from the abstract published in the current number of the *Annales de Gynecol. et d'Obst. de Paris*, to have been a case of extrauterine pregnancy at all. This scepticism is based upon the fact that the entire sac was enucleated quite like a sessile tumor; that no fetal structures were mentioned in the description; and the uterus and adnexa were found to be normal at the time of operation.

General Observations.—This small group of cases, taken as they have occurred in my own practice, together with the additional ones that have been selected equally by chance from the current literature, brings up points which but a few years ago were subjects of earnest controversy and which in several quarters are not yet accepted as settled. Thus, it was scarcely more than a decade ago that Tait found it necessary to exercise all the emphasis of which he was capable in proclaiming the mere existence of such a condition as extraperitoneal gestation.

The profession seemed remarkably reluctant to accept what he urged that he had observed—namely, that the Fallopian tube was capable of rupture between the layers of the broad ligament, and the ovum thus escaping could survive and develop outside of the peritoneal cavity. About this time, however, Berry Hart had a case upon which after death he made frozen sections, demonstrating the existence in that case of an extraperitoneal pregnancy. A little later Bland-Sutton and Greig Smith added their confirmatory observations. Such members of the profession as had not seen these cases, though they were unable to accept the disinterested testimony of competent observers, looked upon the question as settled. There were others, however, who acted upon the assumption that that which did not fall within the range of their immediate experience could not exist, and still clung to the negative side of the controversy. It is hardly to be imagined, however, that individuals of this particular sort can still be found who will insist upon a negative position relative to this question. It is to be conceded, however, that, as Tait pointed out, this class of cases consist of a small minority of extrauterine pregnancies although I do not remember of

any statistics on the subject from his own great work, A. Martin, however, found the condition 7 times in 77 cases; Kelly in his book states that he saw it twice in 23 cases of ectopic pregnancy occurring in 1,000 abdominal sections. The cases which I have here given from my own practice represent a proportion of 3 to 56, not counting 4 additional cases of primary extraperitoneal rupture that I have operated upon at the time of, or immediately following, the accident. This, it will be seen, makes a total of 7 out of 56 cases—a proportion greater than that observed by either Martin or Kelly.

A little confirmatory light is thrown upon the natural history of ectopic gestation by a study of the case which I have presented. I mention this fact in full recognition of the truism that an individual case may demonstrate a concrete fact but cannot establish a general principle. The histories given, however, confirm the well-known fact that the liquor amnii is the first element to disappear by absorption following the spurious labor, and the placenta and the soft parts of the fetus are successively the next parts to go. The time involved in the absorption of these various structures cannot be determined by any observations that I have yet seen recorded, and I fancy can never be reduced to general terms, because absorption, like any other process in the animal economy, must depend for its rapidity and its effectiveness upon a variety of conditions.

In the three cases that came under my immediate observation, one at three months and the other at five months after term, the fetus did not present widely differing conditions. The sphacelated areas were possibly more extensive in the case of longer standing. In the third case, however, the soft structures of the fetus had entirely disappeared. This operation, it will be recalled, was done in the fifth year after the death of the fetus. Just at what stage dissolution and subsequent absorption of the soft parts had been effected could not, of course, be determined. A much more practical lesson, however, one having a direct bearing upon the time and character of the operation to be performed for the relief of these cases, is to be drawn from the conduct of the placenta following the death of the fetus. The cord was intact but not patulous in the case operated upon three months after the death of the fetus. It was intact but in a state of partial dissolution in the second case, while in the third it had entirely disappeared.

The placenta proper had undergone a corresponding degree

of change. Thus in the three-months case there were very pronounced areas of vascularity remaining at the time of the operation; in the six-months case there were likewise some areas that bled to such an extent as to make it seem improper to attempt the immediate enucleation of the placenta; while in the case of long standing not a vestige of the placenta could be found. It would seem, by a comparison of my own cases with the others embraced in my paper, that the conduct of extra-peritoneal gestation differs widely from that which takes place when the gestation sac is within the peritoneal cavity. Thus in my three cases there were no deposits whatever of lime salts and consequently no tendency whatever to the development of lithopedia; nor was it clear that there was a tendency to mummification, such as was observed more particularly in the case reported by Murphy.

It seems, therefore, that so far as these very limited observations are suggestive of treatment a few practical lessons may be drawn: thus, apparently the policy advocated by some writers to wait for the development of innocuous lithopedia is a mistaken one; that is, it may be valid as applied to intraperitoneal gestation, but is dangerous when the embryo develops in the extraperitoneal locus. In other words, the tendency to the formation of lithopedia may be relied upon in the former, but is rather to be discredited in the latter class of cases. There is, however, an obvious advantage in a certain amount of delay, presupposing, of course, the absence of infection, and the consequent freedom from general sepsis. The difficult problem in all of these cases when subjected to early operation has been the disposition of the placenta. Mortalities in the early reports of cases come first from hemorrhage; second, from infection. For it is to be remembered that the site of the placental implantation is very likely to be, as it generally is, one to which ligatures cannot be safely applied and in the event of enucleation of the placenta, recourse must be had to hemostasis by pressure. It is furthermore to be recalled that the enucleation of the yet vascular placenta involves the opening of numerous venous orifices each one of which, and even the intervening lymphatic structure, may become an infection atrium.

In view of these facts it is therefore wiser, in the absence of active symptoms to the contrary to wait from two to three months before attempting the removal of the extraperitoneal gestation. At this date the vascularity of the placenta is liable

to have ceased, and its enucleation in whole or in part, as exemplified in two of my cases, can be safely effected. A much more prolonged delay is, however, hazardous; even in the absence of septic infection from without the absorption of the products of dissolution causes a low grade of sepsis associated with hectic and a consequent loss of flesh and strength. As the soft parts are dissolved, the ends and angles of the bones in turn become areas of mechanical irritation and extreme pain is experienced when the patient moves about.

In the cases of intraperitoneal development of the gestation, some general principles apply, although it would seem that the tendency to the formation of lithopedia is greater inside the peritoneum than outside. In this connection, however, one has brought forcibly to mind the fact insisted upon by Tait, and as many of us have since confirmed, that the digestive power of the peritoneum is sufficient primarily to destroy the identity of the fetus, particularly in the more gelatinous states of its development. The observations of Murphy and others, however, seem to be conclusive that lithopedia may develop within the peritoneal cavity. If we may rely upon this tendency, and to what extent we can thus rely I am not prepared to say, a more protracted delay may be advised. I am not sure but that in the absence of active symptoms to the contrary a longer delay is advisable under any circumstances, when it is known that the gestation sac lies distinctly within the abdominal cavity. I say this because the placental implantation is liable to accident over a very considerable area of peritoneal surfaces, and may involve several of the viscera. It is, therefore, highly important that its vascularity shall have been arrested before any attempt is made either at its enucleation in whole or in part.

The operation to be adopted in any of these cases must depend absolutely upon the conditions presented at the time. No general rule of procedure can be laid down because no two of these cases so far recorded have been identical in the anatomicopathologic conditions which they have revealed. A few general principles ought, however, to guide the operator. (1) He ought to take care not to provoke an uncontrollable hemorrhage. (2) He ought, if possible, to avoid denuding a surface which may become an avenue of infection, the elements of which in many instances cannot be avoided in these cases. (3) He ought, finally, to avoid violent efforts at enucleation,

which will cause serious damage to the intestines or other organs that may be involved in the placental attachment.

It was these considerations, no doubt, which prompted Martin to adopt the technic which found applicability in general terms to the three cases which I have recorded,—a technic which Pozzi has denominated marsupialization. The term seems to be well conceived, implying as it does the temporary establishment of a pouch, such as the marsupials have for the development and subsequent care of their offspring. It is an operation, however, which is not to be employed in any case in which complete removal of the gestation sac and its contents can be practised with safety.

THE GROTON.

A FURTHER CONSIDERATION OF MESENTERIC CYSTS.*

BY

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At the St. Louis meeting of this association I reported a case of mesenteric cyst, presenting therewith the specimen obtained by operation. Since then I have had the rare fortune of encountering a second case, the report of which I will offer at this time.

The fact that two such cases have fallen into my hands, and that too within a year and half's time, induces me to think that these growths may be more numerous than has generally been believed, and that either many go unrecognized even through successful surgical treatment, or else sufficient importance has not been attributed to this subject to secure the reports of all cases which are met with. Certainly every case ought to be recorded, and its character carefully studied, as it cannot, as yet, be said that our knowledge of these growths is complete. Throughout medical literature, as exploited by Moynihan, Treves and others, references are made to about one hundred and fifty cases, the first one having been reported by Benevieni in 1507; a post-mortem finding, as indeed have been most of the others reported in all the centuries since then.

*Read at the Eighteenth Annual Meeting of the American Association of Obstetricians and Gynecologists, at New York, September 19-21, 1905.

Of the cases treated surgically the diagnosis has been necessarily faulty,—usually “ovarian tumor,” “pancreatic cyst,” “wandering spleen” or “floating kidney.” Very generally the true condition has not been considered as one of the possibilities, although it is to be borne in mind that these growths are encountered quite occasionally, and the subject merits our consideration.

As the mesenteric folds enclose connective tissue, fat, lymphatic vessels and glands, bloodvessels and muscular fibers and certain remnants of embryonic life, it is really surprising that this is not more prolific as a cyst-bearing region.

Various attempts at classification have been made; that of Moynihan, embracing serous, chyle, hydatid, blood, dermoid, malignant and sarcomatous cysts, being the one most generally accepted, although certainly not free from objections. Any classification based upon the existing character of the cyst wall is faulty, as shown by Sutton, who refers to the fact that small parovarian cysts are lined with columnar epithelium, which is ciliated in some specimens; in large cysts it becomes stratified and in very big cysts it atrophies.

Dowd suggests that a separation takes place from time to time from the Wolffian body or the germinal epithelium at an early period of embryonic life, and that it is not strange to have such portions carried into the mesentery in the course of development and there form cysts. Blood cysts then would simply be preformed cysts, into the cavities of which hemorrhage has taken place, and likewise chylous cysts would be similar preformed cysts, with an effusion of chyle into their cavities.

Demòn reported a multilocular mesenteric cyst, one chamber of which was filled with blood while another contained chylous liquid, a condition which might be explained on the theory just referred to.

Drs. Fehleisen and Nathan, of San Francisco, removed a large mesenteric cyst, which showed walls largely composed of muscular fibers, strongly suggesting in shape and size the muscular arrangement of the small intestines. It was considered a teratoma, and is also in support of Dowd's position.

Unfortunately many of the cases reported were not passed upon by the pathologist, which is another hindrance to our progress. Just what proportion show an epithelial lining cannot, as yet, be estimated. Following the suggestion heretofore quoted, that

there has been a time in every case when epithelium was present, we may expect to find it in the smaller growths and that the large ones will be devoid of this element. This also tallies with my experience in the two cases here referred to, as many epithelial cells were found in the small cyst, but no trace whatever could be discovered in the large one. Although a positive diagnosis is impossible, and cases vary greatly in symptoms and clinical history, still there are certain resemblances which have been so frequently noticed as to acquire practical value in diagnosis. Most of the cases carefully studied have exhibited repeated attacks of severe abdominal pain, which is intensified in walking; disturbances of digestion, which are sometimes excessive; nausea is commonly but not invariably present. One peculiar and very interesting clinical feature relates to the history of the development of the tumor itself. In numerous instances it was first noticed after a fall or some unusually severe exertion.

Dr. O'Connor, of Buenos Ayres, treated a man for over two years, during which time he suffered from serious indigestion and abdominal pain. One day he alighted with some violence from a moving street car and was seized immediately with severe abdominal pain and noticed a lump below and to the right of the umbilicus. Dr. O'Connor examined him on the same day and describes the tumor as about the size of a coconut, well defined and tense. Fluctuation was obtained, and apparently great mobility, but this could not be thoroughly tested on account of the great soreness present. The man was operated and the tumor found to be a cyst of the mesentery, which was treated by drainage; it contained chyle.

Dr. Rasch, of Tottenham, Eng., also makes a report which suggests some relationship between violent exertion and the first appearance of the tumor. A girl, 21 years of age, lifted a heavy trunk, and some days after was seized with severe abdominal pain; three weeks later she went to the hospital, when a large, round, elastic swelling was discovered in the middle of the abdomen, extending to the left; no diagnosis was made; operation showed cyst of the mesentery containing chyle; the treatment was drainage; a portion of the cyst wall was excised and under the microscope was found devoid of epithelial lining.

Dr. Beach, of the Massachusetts General Hospital, reports a case characterized by soreness and pain in the epigastrium after eating; eructations of gas; constipation; appetite fair; four or five months later, *during an attack of colic and vomiting*, a mov-

able lump was noticed in the abdomen; the tumor could be moved from just above the symphysis pubes to a position corresponding to the right kidney; diagnosis not made, but floating kidney suspected; operation demonstrated chylous cyst of the mesentery. Undoubtedly the explanation of the apparent sudden development of these tumors is to be found in the fact that the mesentery allows such great mobility that the growing mass may have been for years reposing in the pubic cavity, and is only dislodged by the violence of some extraordinary exertion or accidental occurrence, and is for the first time brought to a position which forces its recognition by the patient or her physician; this also explains the frequent disappearance of the tumor after it has been discovered.

My first case, reported last year, was a chylous cyst which was enucleated.

CASE II.—Mrs. S., American, age 34 years; family history negative; always had good health; married fifteen years; three children, 13 to 5 years; appetite fair; complains at times of indigestion; no vomiting nor pain; occasionally constipated. Recently during an attack of la grippe, the family physician, Dr. B. A. Brown, of Brightwood, Ind., discovered a fluctuating tumor about the size of a child's head occupying the right lower abdominal quadrant; thereafter it was sometimes found in the median position and extending into the pelvis.

I was asked into the case by Dr. Brown, and on examination found the pelvic organs practically normal, the tumor having apparently no connection with the uterus nor its appendages. The mass was fluctuating and very movable in every direction. It was also non-sensitive, permitting free palpation without giving pain. Like the first case, which I have reported, the most striking characteristic was the very great and indeed extraordinary mobility, no attachment whatever being defined. The very suggestive mobility impelled me to express the probability that we were dealing with another mesenteric cyst, although I did not feel warranted in making a definite diagnosis.

Operation was performed at the Deaconess's Hospital, Indianapolis, with the assistance of Drs. Bernays Kennedy and John A. Pfaff; an incision to the right of the median line outside the rectus muscle. The tumor was at once exposed, and after evacuating three pints of dark, bloody fluid, I was enabled to determine the relationships of the sac. It was found to be situated between the folds of the mesentery, involving about

eight inches of the lower portion of the ilium. As enucleation would have entailed an ugly resection at the junction of the small with the large gut, I determined upon drainage as the safest procedure, stitching the sac into the wound and using half-inch rubber tube. At the end of ten days the discharge had ceased entirely and the tube was permanently removed and the opening allowed to close up slowly under aseptic dressing.

It has been now more than eight months, and so far there has been no evidence of refilling of cyst, and the woman is enjoying her usual health.

A small portion of the cyst wall was removed for examination, and the pathologist failed to find any trace of epithelium.

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SOME OBSERVATIONS RESPECTING THE TREATMENT OF FACE PRESENTATIONS.*

BY

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TYPICAL cases of face presentations are not common; undoubtedly nearly all cases of such presentation are originally brow positions, but by some irregular uterine contraction and other incidental factors they change to the character of face presentation. This has been made evident by finding previously, on examination, the anterior fontanelle and the sagittal suture before the alteration has taken place. The older statistics usually give the proportion of face presentations as one in about every three hundred, or sometimes one in two hundred and fifty. In my own practice I have found the tendency has been somewhat more frequent,—once in a hundred and fifty. Undoubtedly many cases go unrecognized.

So far as my own observations have been made, face presentations may take place in consequence of a disproportion in the development between the anterior and posterior structures of the neck and thorax, presenting a condition in which the ability of the parts to sustain adequate flexion of the chin upon the thorax was found to be very deficient.

The two principal positions of presentation of this character

*Read before the Eighteenth Annual Meeting of the American Association of Obstetricians and Gynecologists, held at New York, September 19-21, 1905.

are those in the direction of the symphysis pubis and of the sacrum. The fact that the fronto mental and bi-temporal parts present to the plane of the straits, and the base or root of the nose to the center of the pelvis shows that the fetal parts are insufficient to maintain normal flexion. In place of having the nape of the neck of the child as in a normal position, exactly behind the left acetabulum, and the bregma or sinciput to the right sacroiliac synchondrosis we find the forehead pointing to the left iliopectineal eminence and the chin to the right sacroiliac synchondrosis; or second, instead of finding the back of the neck of the child directly behind the right acetabulum and the sinciput to the left sacroiliac synchondrosis, we have again the forehead presenting to the right iliopectineal eminence and the chin to the left sacroiliac symphysis, and other variations instead of the several normal cephalic presentations.

The principal obstacles encountered in face presentations are from the fact that the occipitobregmatic diameter is super-added to the anteroposterior diameter of the child's thorax when the head is forced to descend into the pelvis, and this condition is particularly likely to occur in cases in which the forehead or sinciput presents anteriorly and the occiput becomes crowded back upon the spine of the child. This is the class of face presentations in which the life of the child is most imperiled and the one in which active measures for relief should be timely instituted. The chin should be made, if possible, to rotate toward the symphysis pubis, for by effecting such change there would be less distance for the chin to glide for delivery; should the chin, however, be permitted to rotate into the hollow of the sacrum, it would have to pass at least five times the distance before it would be possible to be delivered.

In those cases in which the child begins to descend with the face anteriorly in the superior straight, I have sometimes succeeded in effecting delivery by resort to podalic version, and occasionally by the cephalic method. I have always found it best when it becomes necessary to change the position, to do so before the membranes have ruptured; the case then should be converted into an occipital presentation, and in so doing I always endeavor to produce flexion and rotation. Forceps I have applied with successful results when the vertex was coming under the arch of the pubes and I had been unable

to effect the necessary rotation for delivery. I never make use of the perforator when the forceps fail unless I have evidence that the child is not living. In cases of face presentation, in which the position of the head would necessitate the carrying of the blades of the forceps high up above the pubes, I have succeeded sometimes by resort to version. In some cases, when the child was still alive, I have resorted to symphyseotomy, and the operation proved to be a most successful method for delivery. There are some deviations which have to be changed to face presentations, as, when the forehead presents and the position cannot be converted into an occipital presentation. If the occiput is anterior in face presentation, natural delivery becomes impracticable, for it has long since been known that should the chin deviate toward the hollow of the sacrum, it would necessitate passing at least twenty centimeters (thirteen centimeters of the sacrococcygeal incurvation and seven centimeters of the distended perineal tissue) before delivery could be accomplished; such a passage of the chin is almost always impossible, owing to the shortness of the child's neck. In such cases it is all-important so to deviate the movements of the chin that it will glide so as to rotate to the symphysis pubis, where it will have only about three or four centimeters to traverse before it can be freed; otherwise, as before stated, safe delivery cannot be effected without resort to extreme radical measures.

Formerly, attempts were made to change a face presentation to an occipital position by the production of flexion and rotation through the use of the lever. Such expedients I have found are almost always futile, and only result in allowing matters to proceed so far as to make it more difficult to convert the frontoanterior position into the chin presentation.

Some operators seem to depend for the most part on the use of forceps for effecting delivery in those cases of face presentations in which the natural powers of the woman have failed. It must be readily admitted that in some cases of this character the forceps will suffice, in other cases version will be more practicable; in other instances for the relief of the mother and the safety of the child, symphyseotomy as before remarked will be a surer and much more satisfactory method of proceeding; especially will it be in those cases in which the head of the child is preternaturally large, or is disproportionate in size to the mother's pelvis, and in which the vertex has

presented and the chin has rotated into the sacrococcygeal curve of the pelvis and has become too firmly fixed.

It has sometimes been stated by authors that as a general principle, face presentations may terminate favorably with scarcely any assistance being offered by the accoucheur, the only drawback met with being much delay in the delivery. Such conclusions are far from being satisfactory. It may be affirmed without fear of contradiction that the mortality of mothers in such cases is upward of six per cent., and that for the children upward of twice that amount—to say nothing of the discoloration and disfigurement of the child, and sometimes not infrequently leaving permanent injuries as a result. Pressure symptoms and exhausting fatigue to the mother, cerebral and cerebrospinal injuries to the child, besides injuries to the veins and other vessels of the fetal parts may be enumerated as some of the untoward lesions left as results.

Beside the causes above mentioned as contributing to face presentation may be mentioned abnormal narrowness of the pelvic cavity, especially that at the brim or superior strait; preternatural size of the posterior cervical and thoracic portion of the fetus; excessive or irregular development of the fetal head more particularly in the occipital portion, dolichocephalic head; morbid production of the liquor amnii; long-continued impaction of the descending colon of the mother, whereby the gravid uterus becomes forced obliquely to the right; lateral and adherent displacement of the uterus as a result of previous inflammatory processes; undue prominence of the fetal abdomen with a corresponding deficiency in the dorsal portions. The existence of any of these peculiar abnormal features tends to the production of face presentation and therefore calls for early interference through artificial assistance before rupture of the amniotic membranes and impaction have taken place.

As before observed, a case though unaided, may make a favorable termination, especially when the condition has been largely due to an excessive amount of liquor amnii and the consequent extension of the mobility of the fetus, nevertheless, the medical attendant should be well on his guard through careful diagnosis to intercept abnormal relations before they have become practically irremediable. Finally, it may be again said that in regard to the employment of further measures of treatment that it is all-important that an early diagnosis of the condition be made.

Here comes the necessity of having acquired proficiency in making an external examination; more particularly is the advantage of that knowledge, *tactus eruditus*, useful, before the membranes have ruptured and the fetal head, brow, bregma, sinciput or occiput has engaged at the superior strait of the pelvis. Schatz's method for relief by external manipulation with the hand, by forcing the breech toward the feet of the child and downward and the thorax backward and upward, has its advantage as an initial measure of proceeding; when, however, the maternal pelvis is narrow and the fetal head has become dolichocephalic, other measures will be demanded, as internal digital manipulation with the fingers against the chin, brow or vertex, or canine fossa of the superior maxilla. This is especially serviceable in mentoanterior face presentations before impaction has taken place. As before remarked in mentoposterior presentations, rotation of the chin should be made toward the symphysis pubis. If the child is alive and the case is that of the mentoanterior presentation and impaction is taking place, and the maternal pelvis is not too narrow, forceps may advantageously be used, otherwise external manipulation as advised by Schatz and version should be had recourse to. For mentoposterior presentations when seen late and the position of the face cannot be conveniently changed and the child is not dead, symphyseotomy offers the best method of procedure for saving both the mother and the child.

When called early to a face presentation and the diagnosis can be clearly made out, chiefly by external examination, and the membranes have not ruptured, or if ruptured and there is a tendency to prolapse of the funis, and the child is alive, and the os or cervix uteri has undergone a considerable degree of dilatation or is dilatable, speedy resort to podalic version will for the most part prove highly satisfactory.

THE TREATMENT OF PUERPERAL ECLAMPSIA.*

BY

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THE treatment as outlined below is based upon the theory that eclampsia is due to an accumulation of a toxin or toxins within the maternal organism resulting from an imperfect or insufficient elimination of the effete elements produced by the fetal metabolism. The cause or causes of puerperal convulsions still rest upon this theoretical ground and, in the absence of a better explanation, it is accepted by all. The exact nature of the poison or poisons is unknown.

For the sake of clearness and brevity, the subject is arranged as follows:

- (1) The Prophylactic Treatment.
 - (a) Before appearance of symptoms.
 - (b) After appearance of symptoms.
- (2) The Curative Treatment.
 - (a) To control or abbreviate convulsions.
 - (b) To protect the patient against injuries during the attack.
 - (c) To remove the supposed cause of the eclamptic seizure.
- (1) *The Prophylactic Treatment of Puerperal Eclampsia.*
 - (a) *Before the appearance of symptoms.*
 - (b) *After the appearance of symptoms.*

(a) *Prophylaxis before the appearance of symptoms.* It is indicated in every case of pregnancy and consists of an intelligent management of the pregnant state.

This implies that all the emunctories of the body, the kidneys, the liver, the intestines, the lungs and the skin, of the pregnant woman must be kept in perfect order.

This, in turn, means a careful observation of the patient's surroundings, of diet and of dress, of sufficient rest and sleep, and an especial care of the functions of the liver and kidney, regular intestinal evacuations, invariably clean skin, perfect

*Read at the Eighteenth Annual Meeting of the American Association of Obstetricians and Gynecologists, at New York, September, 19-21, 1905.

freedom of respiration and daily judicious exercise in the open air.

On an occasion like this it is not necessary to consider all of the means of the management of pregnancy in detail. It is only of importance to call your attention to the same and to add that, in an earnest and well-directed conduct of the pregnant state lies the physician's greatest power to prevent, in very many instances, even the prodromal symptoms of eclampsia.

(b) *Prophylaxis after the appearance of symptoms.* In the presence of a well-marked edema, anemia, hydremia, with or without albumin in the urine; severe and oft-recurring headaches, gastralgia, tinnitus aurium, dimness or difficulty of vision, dizziness, general indisposition, restlessness, insomnia, or irritability of temper, a definite and persistent plan of treatment for the relief of any or all of these symptoms must be adopted.

If the symptoms be few and mild, the strict observance of the ordinary rules of the hygiene of pregnancy, if they were not observed before, will suffice in many cases. If, however, symptoms manifest themselves notwithstanding a strict observance of the well-established rules of the management of a normal pregnancy, or in cases where this is not done, groups of the prodromal signs clearly manifest themselves, a more vigorous plan of treatment is indicated. The following course is indorsed by the best authorities everywhere:

Milk diet, strict and absolute, from the start. Milk is recognized as "a complete aliment reconstituent, quickly and easily digested";¹ it leaves no toxic residue in the intestinal tract. Water may be given ad libitum. As the patient's condition improves, fish and white meats may be added to the diet.

Catharsis must be prompt, free and regular every day. While the means must necessarily vary according to the habit and general health of the patient, Winckel's pill of aloes and colocynth, with or without calomel, before bedtime and followed by a saline draught in the morning, is a very reliable remedy. In cases of severe constipation or great urgency, calomel or compound jalap (singly or combined), may be given at night in full doses; to be followed by a dose of one of the stronger sulphur waters, like the Rubinat, in the morning. Excessive catharsis should be avoided at all times.

Calomel, combined with bicarbonate of soda is, perhaps, the best remedy when the liver is involved, to evacuate the bowels. In the presence of well-marked prodromal symptoms or of an

impending attack of convulsions, five grains of calomel in conjunction with ten or fifteen grains of compound jalap, may be administered. A frequent and annoying complication is chronic constipation. Much will depend upon the physician's skill and experience in combating this difficulty. To meet many of the indications Edgar advises a tablet composed of calomel, digitalis, squills each gr. $\frac{1}{2}$ (0.66) and muriate of pilocarpine 1-20 of a grain before bedtime; to be followed by a full dose of Villacabra water the next morning.

Hot baths, daily for a few days in some cases and two to three times a week in other instances, are the best means to render the skin clean and active and, when accompanied by large draughts of hot water, light tea or milk, the kidneys are not only greatly relieved, but their activity is very favorably influenced thereby. The hot sponge, or hot-air bath may be substituted for the hot water bath in the absence of a bath tub. The fact that these measures may cause abortion or precipitate labor must not be forgotten; though either event may be welcome and even very desirable at times. The action of the skin may be increased by gentle massage immediately after the hot bath or pack, and maintained by the wearing of woolen or flannel underwear.

Pilocarpine as a diaphoretic is, as a rule, contraindicated, but some authors indorse its administration in the preeclamptic stage in the absence of heart disease.²

Glonoin, from one to two minims is highly recommended as one of the best diuretics or rather heart stimulants. Bacon advises rest instead of stimulation of the kidney, arguing that a kidney already injured and inadequate should not be subjected to irritants which are likely to increase its injuries. He excludes especially the metals, coal-tar products, volatile oils, aloin and urotropin.

Fresh air, an abundance of fresh water, gentle exercise, calisthenics and massage are conducive to rapid elimination of the effete matters from the maternal system. If the condition of the patient forbids out-door exercise, free ventilation of the room, in conjunction with moderate calisthenics and massage, is the best substitute.

Dress should be so arranged as to allow the most perfect freedom of respiration, locomotion, and to correspond with the season of the year or the climate in which the patient lives. Woolen or flannel underwear should be insisted upon, in cold

weather at least, and it will benefit the patient greatly if either kind be worn at all times.

Sleep and rest in bed are absolutely necessary when the patient is weak and the extremities edematous. The former is most effectually induced by small, but frequently repeated, doses of chloralhydrate per os or per rectum. From five to ten grains, well diluted, may be given by the mouth every half hour or hour until sleep is secured. Double or even treble the amount may be thrown as often into the rectum if the stomach is irritable. This drug may be daily administered in small doses for a long time without any deleterious effect upon either mother or child. It is all the more indicated in severe anasarca, bronchitis with pulmonary congestion, digestive disturbances and headaches. When there is anemia or hydremia, suitable iron preparations must be prescribed. Basham's mixture is one of the best.³

(2) *The curative treatment of puerperal eclampsia.*

Obstetric authors and experienced accoucheurs usually recognize three distinct varieties of puerperal convulsions: (a) The malignant variety, which does not yield to treatment at all. (b) The benign variety, in which recovery takes place spontaneously and (c) the variety of mean gravity, in which both course and cure are favorably influenced by careful and judicious treatment.

(When we compare this classification with Edgar's recent division of clinical types of pregnancy toxemia (a) will correspond to the acute and fulminant toxemia and the toxemia-coma without convulsions; (b) to the benign and pseudo toxemia, and (c) to the subacute and accumulative toxemia as well as the acid intoxication simulating hepatic toxemia.)

The gravity of the cases, too, varies according to the time of pregnancy, labor and puerperium. The prognosis is much worse when convulsions supervene during pregnancy; the maternal mortality ranging between 35 and 50 per cent. and the fetal mortality between 65 and 70 per cent. The prognosis of intrapartum convulsions is more favorable; the maternal as well as fetal mortality amounting to about 25 per cent. In post-partum convulsions, the maternal mortality is reduced to about 7 per cent.⁴

The prime object to be attained is

- (1) *To control and abbreviate the duration of the seizure.*
- (2) *To protect the patient against injury during the attack.*
- (3) *To remove the supposed cause of eclampsia.*

(1) *To control or abbreviate the duration of the convulsions*, the limited inhalation of chloroform, the hypodermic injections of veratrum viride and of morphine, singly or combined, and the administration of large doses of chloral per rectum have been, for many years, the principal remedies for this purpose. It is to be regretted that bleeding has been and is still absolutely rejected by many of our best authors. The writer agrees with Parvin who said: "It is as wrong to reject it entirely as it is to bleed always." Fordyce Barker's indications for bleeding "When the attack occurs before labor, if the pulse be strong and hard with fullness of the vascular system and when the appearance of the face indicates vascular congestion, bleed at once," is as true a guide to-day as it was then. Copious bleeding is always contraindicated.

Chloroform by inhalation during the attack is universally employed, but it must not be forgotten that its long and continuous use may lead to fatty degeneration of the heart and impairment of the function of the kidney and liver.⁵ Ballin⁶ reports nine post-operative cases of acute yellow atrophy of liver the following chloroform narcosis.

The hypodermic employment of the *tincture of veratrum viride* (first recommended by D. Baker of Eufaula, Ala., 1859, and since then by many others, but especially by Reamy of Cincinnati and Jewett of New York) has grown in favor with the profession, especially in this part of our country. Both Reamy and Jewett maintain that if 10-20 minims of this drug are injected under the skin every half hour or hour (gtts x every half hour or gtts xx every hour) until the pulse rate has been brought down to 60 per minute, convulsions will not occur thereafter if the pulse is kept down. My own experience with this remedy in the last ten cases tends to support this statement.

The administration of large doses of *morphine* (one to one and one-half grains to be repeated every two hours if the convulsions return), as recommended by Dr. Clark of Oswego, N. Y. and by Prof. Veit,⁷ has not been received with much favor. Many, like myself, have made only one trial because of the threatening symptoms following. In my own case only one injection of one-half grain was given. The convulsions ceased. Within the next twelve hours, pulse fell to twenty-five beats and the respiratory movements to eight per minute. The patient recovered, but I have not had the heart to repeat this treatment.

Morphine in large doses is now generally rejected, because it not only prolongs the post eclamptic stupor but it 'increases the tendency to death during coma by its interference with the elimination process.'⁸ The use of *veratrum viride* has, on the contrary, become more popular. It is by many regarded a powerful nerve stimulant and cardiac inhibitor. The results with its employment have been very satisfactory with many obstetricians. Davis of Bridgeton, New Jersey, and Parvin have recommended the combination of tr. *veratrum viride*, five drops, with morphine $\frac{1}{2}$ grain, to be injected under the skin with every recurring attack

Chloralhydrate is more in favor abroad, especially France and Germany, than in this country. When given to control convulsions, it has always been a disappointment to me. From 20 to 40 grs. may be introduced into the rectum at intervals of an hour or two. As much as 180 grs. and more have been given within 24 hours without ill effects. Chloral, like *veratrum viride*, lessens arterial tension, and is best tolerated in the bowel when suspended in mucilage. Veit gave to a young primipara 120 grams (1800 grs.) within one month without the least deleterious effect upon mother or child. Patient was the victim of severe anasarca, bronchitis, with pulmonary congestion, digestive disorders and headaches. She had no convulsions. Chloral is one of the most helpful remedies in the pre-eclamptic stage.

The use of the *normal saline solution*. in moderate quantity under the skin and copiously per rectum, is highly spoken of by many recent authorities, and the writer has had good results with them in conjunction with other remedies.

The value of the *extract of the thyroid and parathyroid glands*, as recommended by Nicholson and endorsed by Bacon, of Chicago, and Davis, of Philadelphia, for the treatment of eclampsia, awaits further confirmation. Nicholson claims that it destroys the metabolic and other poisons, and that it is an efficient diuretic and nutritive stimulant.

The withdrawal of cerebrospinal fluid by lumbar puncture (Helme and Kroenig) for the relief of intracranial pressure, is a hazardous and doubtful procedure.

Oxygen inhalation is of value during and between the attacks, because of the danger of asphyxiation from impeded respiration. It stimulates the weakened heart and is an ex-

cellent remedy for the slowing of respiration, the result of prolonged anesthesia.

Any of the above means may be employed, singly or combined, during the attack, and, with the exception of chloroform, can be continued at proper intervals, after the convulsions have ceased, until the object desired has been obtained. If certain medicines are given in combination, the smallest effective doses should be administered in short intervals.

(2) *To protect the patient against injury during the convulsions* care must be taken to prevent her falling from the bed or striking against hard and sharp objects near her; the convulsive movements must not be restricted, nor the contracted fingers pried open; the tongue is best guarded against lacerations and biting by the teeth and the movements of the jaw by interposing a napkin or soft towel between them. This, too, prevents falling back of the tongue. If it has fallen back it must be pulled forward. The pharyngeal cavity may be kept as free as possible from the accumulation of fluids from mouth and pharynx by turning the face to one side and wiping the cavity with a cloth tied to the handle of a spoon; if the cloth-covered finger is used for this purpose care must be taken that it is not caught between the jaws.

(3) *Means to remove the supposed cause of the disease* from the system must be resorted to as early as circumstances will permit. Much of what has been said under the heading of "*Prophylaxis when symptoms have appeared*" holds good here. Prompt catharsis, diaphoresis, and cardiac stimulation must be instituted. The same means recommended above hold good here and may be carried out in the same manner, except when the patient is in convulsions or deep coma. If the latter, the bowels should be emptied by a copious and high enema, containing magnesium sulphate in solution. It is doubtful whether the practice of dropping croton-oil upon the tongue is of any value, indeed, it probably does more harm than good. If the hot water or air bath, or the hot-pack, or the dry or wet-cupping over the kidneys, in conjunction with the administration of tr. ver. virid., the hypodermic use of glonoin, and, perhaps, of morphine in moderate doses, is not attended by a marked improvement, the case is, probably, a hopeless one and even the prompt evacuation of the uterine contents will not prevent a fatal issue. There is another danger: In our anxiety for saving the patient's life, too many of the rem-

edies recommended are employed at once, and thus the patient is overwhelmed with drugs. This is worse than no treatment at all.

Notwithstanding that interruption of gestation by induction of labor, artificial delivery or accouchement forcé, has not been attended with the good results so ardently expected, emptying of the uterus is the only logical mode of treatment in severe cases where a judicious trial of other means have failed to give relief. Spontaneous miscarriage, premature birth, or death of the child in utero have been, almost invariably, followed by an immediate and marked improvement of the patient and subsequent complete recovery.

If the results of artificial evacuation have been disappointing in the past, the fault may be, to a certain extent, with the method employed. All the means of inducing abortion or labor are slow and more or less annoying and irritating in character. This, in many cases, is sufficient to precipitate convulsions, if they did not exist before, or cause a recurrence if they did. Digital, manual, balloon or metal dilatation of the cervix, followed by immediate or slow extraction of the child, at any stage of pregnancy, or even in the beginning of labor, are means never devoid of violence, and nearly always attended by injury, and the dangers to the mother increase in exact proportion to the remoteness of obliteration of the cervix and dilatation of the os.

If, then, evacuation of the uterus is determined upon in any case, deep cervical incisions or vaginal hysterotomy, followed by forceps (or version) and extraction should be the means through which the uterine contents are removed if eclampsia comes on before the end of term. If the patient be near the end of term, vaginal hysterotomy may still answer the purpose, provided the child be not very large and in a favorable presentation and position. If the patient has concluded the period of gestation, but the cervix is not completely effaced, the os still closed, the child vigorous with, perhaps, strong indication of excessive development or, possibly, a pelvis not too ample or both, indeed, when there appears to be a distinct disproportion between passage and passenger, the conservative Cesarean section is undoubtedly a proper procedure in the presence of asepsis and a skilled operator. The same is true in cases of marked pelvic contraction or deformity or any kind, if the child has obtained the period of viability.

Digital, manual, balloon and metal dilatation should not be attempted, unless the parts involved can be quickly opened up and without injury. Shock, excessive hemorrhage and prolonged operative interference must be scrupulously avoided.

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- 13 GARFIELD PLACE.

INTERMITTENT HYDROSALPINX.

BY

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MRS. T., age 25, married, housewife, an American by birth, entered the Presbyterian Hospital of Chicago complaining of headache, backache, bearing-down sensation in the pelvis, pain in the right side of the pelvis, irregular menstruation, dysmenorrhea, leucorrhea, dizziness, nausea and loss of appetite.

History of Present Trouble.—In the latter part of April, 1905, she first experienced a backache and great pain during her menstrual periods, which were then exceptionally profuse. The dysmenorrhea increased from month to month up to the present time (July 5, 1905). Two years ago she acquired a gonorrheal infection, which inaugurated a leucorrheal discharge, which has persisted to the present time, but since last April has been more abundant and of an offensive odor. Since April she has noticed the gradual increase of a swelling in her right side, which is tender to pressure. About the time of the appearance of this swelling she began to be troubled with nausea, and this has continued to the present time.

Sexual History.—Married five years; one child four years old, two miscarriages, one two years ago, the other one year ago.

Menstrual History.—Began to menstruate at 12 years of age, of the twenty-eight-day type, until two years ago, since which

time the menstrual periods have been very irregular. Prior to this time the duration of the flow was three to five days; but during the past two years, the period of her gonorrheal infection, her periods have been lengthened to ten to fifteen days. They were not painful prior to two years ago, but are now increasingly so.

Family History.—Father and mother living and well. Two half sisters and two half brothers also living and well. One half sister has some lung trouble.

Personal History.—Usual diseases of childhood; scarlet fever and diphtheria when eleven years of age; rheumatism following the scarlet fever.

Physical Examination.—I first saw the case two weeks prior to the date of the operation, at which time the uterus was found slightly increased in size, uniformly firm in consistency, restricted in its mobility, slightly sensitive to pressure, and crowded into a left lateral position. On the left side there was some tenderness, and the tube and ovary were outlined as slightly enlarged and firmly fixed. On the right side of the uterus was a swelling the size of a fetal head, round, cystic, slightly tender, and immovable. From the cervix there exuded a purulent secretion. These findings were corroborated by three of the attendants in the dispensary, who had examined her from time to time during the previous two weeks. I made a tentative diagnosis of an ovarian cyst or hydrosalpinx, and advised an abdominal section. Two weeks later she entered the Presbyterian Hospital, when, on examination, the tumor to the right of the uterus had disappeared, leaving an indefinite resistance low in the right side of the pelvis. My first thought was that the cyst had ruptured into the free peritoneal cavity; but, on questioning the patient, I learned from her that on the morning of her admission to the hospital she removed a tampon, which had been inserted the previous day at the dispensary, and when the tampon was removed a large quantity of watery fluid escaped from the vagina. She stated positively that it was not the emptying of the bladder. She also stated that simultaneous with the appearance of the flow, the pressure symptoms in the right side were lessened and her nausea disappeared. I then thought of the discharge of the contents of a hydrosalpinx into the uterus.

On the following morning, after a curettage, I opened the abdominal cavity and found on the right side a thin-walled tube with about two drachms of serous fluid contents, and its walls greatly

relaxed. There was no rent in the wall of the tube. This tube and corresponding ovary were adherent to the broad ligament and the pelvic floor. On the opposite side the tube and ovary were matted to the bowel, but were not enlarged. There were also adhesions binding the uterus to the loose coils of intestine. There could be no question as to the diagnosis of a hydrops tubæ profluens, and probably of gonorrheal origin.

One month has passed since the operation, and the patient is relieved of all pressure symptoms and nausea.

There is surprisingly little to be found in the literature on the subject of hydrops tubæ profluens or intermittent hydrosalpinx.

Scanzoni describes a post-mortem section in which one tube was found distended with serum, the other a collapsed sac. This was probably the first recorded anatomical observation of this rare lesion.

Hennig collected ten cases in the literature. Thüre Brandt, and later Ziegenspeck, each reported a case in which the tube contents was expressed into the uterus by a system of massage. Again Ziegenspeck collected fourteen cases of his own and nineteen of his students', in which the tube was emptied into the uterus by massage.

Something of the rarity of the lesion may be inferred from the experience of Martin, who reports eight cases of hydrops tubæ profluens in 1,700 cases of salpingitis. Martin records two cases of spontaneous rupture of hydrosalpinx into the abdominal cavity, and eleven cases in which the hydrosalpinx was ruptured, the contents escaping into the abdominal cavity in the making of bimanual examinations. Martin writes that sactosalpinx profluens presupposes a temporary closure of the uterine end of the tube by swelling of the mucosa or kinking of the tube. The secretions of the tube are prevented from passing into the uterus until the intra-tubal pressure overcomes the obstruction at the uterine end of the tube.

J. P. Frank describes a case in which, for a period of six months, a half liter of serous fluid was discharged daily from a tube into the uterus. At the end of this time a post-mortem examination disclosed a tube containing three liters of serous fluid. Schramm reported a case in which a tumor the size of a man's fist was palpated at the side of the uterus, and one week later, when the abdomen was opened, a collapsed hydrosalpinx was found.

Bland Sutton questions the possible occurrence of escaped fluid from the tubes into the uterus. He says: "There is no trust-

worthy pathological evidence that these discharges escape into the uterus by way of the Fallopian tubes." He cites a case reported by Skene Keith in *The Lancet* of May 2, 1891, in which an unmarried woman of thirty-five years had suffered for fifteen years from discharges of fluid from the uterus which were so profuse as to necessitate the wearing of dresses lined with water-proof cloth, and every night her bed was made up as for a confinement. As a last resort, her tubes and ovaries were removed, and were found perfectly normal; no satisfactory explanation could be offered for the watery discharge, which continued to come from the uterus after the appendages were removed. Sutton concludes that gushes of watery fluid from the uterus are not pathognomic of hydrops profluens. Again Sutton cites a case reported by Doralis, in which a woman of twenty-eight years had both tubes and ovaries removed; the right tube formed a cyst the size of a nutmeg and masses of papillomatous growths sprang from the inner wall of the tube. The tube lumen at the uterine end was exceedingly small. A sero-sanguineous discharge continued to come from the uterus, in spite of repeated curettage; in fact, the scraping of the uterus served to aggravate the condition.

Henry D. Ingraham made a clinical report of two cases which were not verified by abdominal section. In the first case there were periodic watery discharges, and preceding each discharge there appeared in the left side of the pelvis an elastic tumor, which disappeared simultaneously with the discharge of fluid from the uterus.

The second case was that of an unmarried woman twenty-six years of age, who for the past three years experienced a sense of fullness and discomfort in the abdomen, most pronounced in the left side of the pelvis. This occurred with great regularity about ten days before each menstrual flow. The distress increased gradually for about seven days, when there would be a profuse watery flow from the uterus. The discharge was without color or odor, and was occasionally repeated on one or more successive days. The patient estimated that she lost about a quart of water each period. Following the discharge, the discomfort in the abdomen disappeared, only to return with the approaching menstrual period.

Alban Doran says: "The natural tendency of an obstructed tube is doubtless toward cure by spontaneous relief of the obstruction. The liability of the patient to repeated attacks of pelvic inflammation often prevents spontaneous cure. Closure of the uterine end by simple swelling of the mucous membrane must obviously be

relieved when the swelling subsides; it is not apt to be permanent in salpingitis or perimetritic closure of the ostium. Temporary subsidence of the swelling of the uterine end fully accounts for hydrops tubæ profluens. The ostium remains in these cases firmly closed, but the fluid in the tube rushes out of the uterine end and escapes externally. Hydrops profluens may be caused by simple hydrosalpinx, by congenital tubo-ovarian cyst, or by growths within the tube. The term indicates rather a symptom than a definite disease. This disease may be serious, as in the case of a married woman forty-six years of age, who ceased to menstruate for two months, and then suffered from colicky pains in the abdomen, uterine hemorrhage, and a free serous discharge from the uterus. Eight months after the onset of the symptoms an abdominal section was made, and in either tube there was found a malignant papillomatous growth and an abundance of serous fluid."

Skene refers to a case seen in consultation in which a cystic tumor was found in the cul-de-sac of Douglas, which repeatedly emptied itself through the uterus. The escaped fluid was turbid. Pressure pains were temporarily relieved, only to return again when the tumor refilled. After two such attacks recovery ensued for seven years, which marked the date of the last report.

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PUS COLLECTIONS IN THE FEMALE PELVIS.*

BY

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IN considering this subject two anatomic regions of the pelvis must be spoken of in describing accurately the pathologic states. Note must be taken of intraperitoneal and extraperitoneal collections of pus. These two forms of pus accumulations in the pelvis arise through different avenues of infection, and their diagnostic, prognostic and therapeutic significance varies accordingly. While this classification is justifiable in some cases, clinically, it is difficult to determine the variety, because both types of pus collection may and do exist in the same patient at the same time. In puerperal cases, for example, both an intra and an extraperitoneal collection of pus may be present. The patient may have a large abscess in the layers of the broad ligament and a pyosalpinx may exist at the same time. The intraperitoneal type is of course by far the more frequent and may result from infection from either of two sources. First, the infection coming from without by way of the vulva, vagina, endometrium and Fallopian tube, and second, that starting within the pelvis. The latter cases are those where the pus collections occur as a result of suppurating cysts or other tumors, bowel perforations and pelvic hematomata that have suppurated. The hematomata may be the result of ectopic gestation, bleeding from the fimbriated extremities of the Fallopian tubes, or else they result from menstrual reflexes. Such reflexes have been claimed to exist and occur with greater frequency than clinical evidence seems to point out. By far the more frequent cause of intraperitoneal accumulation of pus, is infection from without, and in dealing with the subject we must consider the inflammatory affections of the uterine adnexa, as well as that of the body of the uterus. In the intraperitoneal variety, the pus accumulations may be in the tubes, ovaries, or both in structures adherent to each other, forming the tuboovarian abscess. Pus

*Read before the Woman's Hospital Society, October 24, 1905.

may be in the cul-de-sac of Douglas or between the coils of intestines, or at the tip of the appendix, the organ hanging down into the pelvis. We may find the abscess anterior to the uterus, or at the fundus, with coils of intestines forming the abscess wall. These collections of pus are all due to microbic invasion, the germs reaching these parts, either by continuity of tissue or by way of the lymphatic stream. Bacteriology and clinical evidence demonstrate that the agents of infection are the pyogenic germs and gonococci. The germs find their way to the pelvic organs by way of the vagina and uterus. The pus-producing germs, however, are more apt to spread by way of the lymphatics also. Not so with the gonococci. These germs spread by way of the mucous membrane. The inflammatory reaction, therefore, in gonorrheal infection is more confined to the tubes and ovaries and around mucous membrane surfaces that harbor the infection. The pyogenic germs, on the other hand, spreading also by the lymphatics, reach the pelvic peritoneum more readily and a wider area of invasion may be the result. This widely spread infection introduces a new element into the pathology of these infections, peritoneal adhesion. As a result of this adhesive inflammation, tubes become adherent to ovaries and these organs in turn to adjacent structures. Not alone the tubes and ovaries, but coils of intestine and omentum share in this adhesive inflammation. Pus may thus collect between these adherent structures, giving rise to abscesses of various dimensions, some spaces holding more pus and some less. There may be two or more of the pus pockets and these pus collections may be found in various regions at the same time, in the same patient. There may be an abscess in the tube, a true pyosalpinx and another in the ovary, or small collections of pus may at the same time be found in the cul-de-sac, or lodged between coils of adherent intestines, with omentum tucked in here and there to shut the infection off from the general peritoneal cavity. Given a case of this kind, only that therapeutic measure which deals with each one of these pus collections at the same time, can bring relief.

In gonorrheal infection only the parts directly involved and tissues immediately adjacent suffer materially from the germ invasions. The process is more of a local nature, although acute peritonitis may also be initiated by the specific germ. Indeed, the patient may suffer from both kinds of infection, the gonococcus, so to say, paving the way for the pyogenic germ. But

in cases where the infection is gonorrheal alone, the inflammatory reaction will be confined to the endometrium, Fallopian tubes and perhaps the ovary. Intraperitoneal collections of pus are not so apt to be present as in the pyogenic infections. When the gonococci invade the female genitalia, the infections spread by continuity of tissue usually along the mucous membrane, but it is also possible for the germ to invade submucous tissue, and even to enter the circulation. Tissues remote from the seat of infection may thus suffer as a result of the gonorrheal process. The endocardium is frequently the seat of inflammatory reaction, caused by the gonococcus, and the same is true of the joints and meninges. It is still an unsettled question as to what extent the nervous system is affected by the gonotoxin, and to what extent the tissue reaction is due to the presence of the germs themselves, or to their toxine.

In pyogenic infection, the germs reach the parts by way of the lymphatics and tissue continuity. These infections are usually the result of contaminations in the puerperium, abortion or non-sterile instrumentation. Intrauterine applications under faulty aseptic technique are a fruitful source of endometrial infection, with subsequent spread of the disease. A severe case of pelvic peritonitis, with multiple abscesses through the pelvis, came under my observation, where the infection could be traced to the use of an intrauterine stem, worn for the cure of sterility. The patient was a woman of 32, married five years, with no history of pregnancy. She was advised to submit to a curettage and to wear an intrauterine pessary. All went well for a week after the curettage, when symptoms of sepsis appeared. On removing the stem pessary the interior of the uterus was one abscess cavity. Abdominal section revealed many small abscesses within the body of the uterus and numerous pus collections all through the pelvic contents.

It is interesting to note that in these pyogenic infections, it is the streptococcus that is most frequently the offending germ, the staphylococci aureus and albus, are found very uncommonly. Collection of pus in the pelvis may also be due to the colon bacillus.

It is also interesting to note that in those cases of pus collections in the pelvis, where the acute symptoms have subsided, the purulent material gives negative cultures in quite a large proportion of cases. To the clinician this is an important

observation. The mortality of operations in these sterile cases is nil, while operation undertaken for the relief of pus collections in the pelvis, in the presence of acute symptoms, has a considerable mortality. It also points out the fact that judicious procrastination in these cases is wise and proper. So long as no symptoms appear that threaten life, or where there is evidence that the infection is not so very virulent, delay in operative intervention is advisable. A natural sterilization of the purulent material is to be looked for and hoped for. It is impossible to tell without bacteriological investigation, at the time of the operation, whether a certain pus accumulation is sterile or not. A patient may present no symptom of active inflammatory reaction, and yet the purulent material in the pelvis may not only harbor germs, but their virulence may be considerable. A patient of mine with a pelvic abscess had already been free for weeks of active inflammatory systemic reaction, and operation was undertaken with the hope of dealing with a sterile abscess. In this case an accidental contamination of the peritoneum was followed by an attack of peritonitis which nearly destroyed life. Not only were germs demonstrable in the pus, but their virulence must have been quite considerable.

Another class of intraperitoneal collections of pus is not caused by an infection coming by way of the vagina and endometrium, or by way of the lymphatics. I refer to those cases where a puncture of the uterus is the point of inoculation. This pathologic condition is not very frequent, yet it occurs frequently enough in criminally induced abortions, to deserve mention. In many of these cases, when the patient comes to the operating table, the rent in the uterus has long ago healed, the uterine adnexa are normal, and the case looks more like a collection of pus that results from infection, following bowel perforations. Were it not for the history of the infection, one could not tell the source of the initial inoculation. I witnessed a post mortem several years ago, where a criminal abortion had been done by an ignoramus. The uterus was pierced and one coil of gut was also injured. The patient lived nine days, and at the autopsy no vestige of the uterine puncture was found, although a hole in the uterus was positively diagnosed eight days previously, the wound in the organ having healed and practically a primary union had occurred in the injured gut also. The following case of puncture of the uterus and double chronic

purulent salpingitis, came under observation. The pus collections in the pelvis were doubtless due to uterine puncture, the pathologic state being complicated by an old adnexal disease. The patient, Mrs. S. was seen in consultation and the following history obtained. She is 38 years old, has been twice married. She had been married a year, after a long period of widowhood. By her first husband she had one child, now a grown-up daughter. The patient did not want another child. When she missed her regular period she wished to relieve herself of the supposed pregnancy. She thought of accomplishing this by introducing into the uterus an ivory handled pen holder. Failing to accomplish anything the first time, she repeated the operation, this time with the aid of a kindly disposed neighbor. She suffered considerable pain immediately following the manipulation. When I saw the case four days later she was suffering with a general peritonitis. There was present marked tympanitis confined to the region of the abdomen, below the umbilicus. Temperature considerably elevated, with a corresponding pulse rise. Bimanual examination under anesthesia revealed a fairly small sized uterus with two masses, one on either side of that organ. While under the anesthetic the uterus was curetted with extreme care and gentleness. The organ was found empty, nor did the os indicate that pregnancy had recently been present. Ten days later the abdomen was opened, revealing a most interesting, as well as curious pathologic state. The sigmoid flexure of the colon, with the greater omentum covered over the entire pelvic contents so effectively that no mechanic could fit a cover to a receptacle more thoroughly. After finding a point of cleavage, the sigmoid was separated, showing on its adherent surface a slough, larger than the palm of a hand. Beneath this was an abscess, the walls of which consisted of fundus of uterus, omentum and several coils of intestine. Much apprehension was felt about this sloughed wall of the sigmoid, but no disturbance followed from this source. After clearing the pelvis of pus and adherent coils of intestine and omentum, the diseased adnexa were amputated and a posterior drain inserted. The abdominal wall was closed in layers. The uterus showed no sign of a puncture, and yet such must have been the point of inoculation; the acute onset of the symptoms and pathologic process would point in that direction. Recovery took place in this case after a desperate illness, lasting several weeks.

In the extraperitoneal variety of pus accumulation in the pelvis, we consider the anatomic arrangement of the broad ligaments of the uterus and their relation to the contents of the pelvis and abdominal wall. It is in this region of the pelvis that pelvic cellulitis occurs, a pathologic entity that was thought to be of so much importance in the early days of the science of gynecology. Abscesses in this region may be due, not alone to an infective process that comes by way of the lymphatics from infected wounds of the perineum, vagina and uterus, but from pus accumulations that occur from broken down hematomata of the broad ligaments. These hematomata result from rupture of varicose veins in the broad ligament, or ectopic gestation, when the pregnant tube ruptures into the broad ligament. Hematomata also occur as a result of traumatic rupture of some of the vessels of this region. Again, traumatized cellular tissue does not resist an infection effectively and a cellulitis thus initiated may terminate finally in an abscess. The pathologic process in these cases is at first an infection at the base of the broad ligament, which resulted from a microbic invasion of the wounds of a lacerated cervix, occurring in the act of delivery. A lymphangitis is the result. The product of inflammation gradually dissects up the layers of the ligament and extending, the induration may finally appear on the surface of the abdomen, immediately above Poupart's ligament. The induration may also appear in front of the bladder region or that of the uterus, but as these extraperitoneal collections of pus are mostly unilateral, the induration occurs a little above Poupart's ligament. Cases have been reported where the abscesses in the broad ligament dissected up the pelvic peritoneum posteriorly, the induration appearing at the great sacrosciatic notch. These cases, however, are rare. Pus in this region of the body, as elsewhere, follows the course of the blood vessels more frequently than that of the tendons or nerves. Pelvic abscesses, pointing in Scarpa's triangle, have also been reported. That it is possible for an abscess in the broad ligament to break into the rectum, bladder or vagina, is admitted, yet these conditions occur very infrequently. Many of the reported cases as such, doubtless belong to the intraperitoneal suppurations. Wounds of the perineum and vaginal lacerations becoming infected, may set up a lymphangitis of sufficient intensity to spread to the cellular tissue in the broad ligament, and subsequently break down into pus with the formation of

an abscess. The most frequent cause of these pus collections in the broad ligament is an infective lymphangitis at its base. The infection occurs during labor, the wounds of the lacerated cervix becoming invaded by pyogenic germs, causing puerperal septicemia and a localized collection of pus. The same infection, also, may cause an endometritis and the whole chain of infective inflammations to which the puerperal woman is so susceptible. In a case of puerperal septicemia coming under observation, the most careful examination failed to show anything but an infected wound in the cervix. The examining finger broke into an abscess cavity in the left broad ligament. The evacuation of the pus and careful surgical attention to this region of the genital tract, brought a prompt amelioration of all symptoms, the systemic defences of the body effectively ridding the organism of toxic products, soon after. Some cases of pelvic cellulitis and thrombophlebitis of this region terminate in resolution, apparently even in the presence of a virulent infection. A case of this kind was under my care quite recently. This patient induced abortion on herself and developed symptoms of sepsis. The uterus was curetted and products of conception cleaned away. She entered on a protracted course of illness, lasting ten weeks, with most violent rigors and profound sepsis. Even at the end of the fourth week of her illness, marked chills would occur, with most astounding rises of temperature. It is a matter of great surprise to me that a final recovery took place in this case. Although the septic process was so marked and the virulence of the infection doubtless quite severe, the most painstaking examination failed to show any tangible pathologic lesion, except a slight fullness of the lower edge of the right broad ligament. This condition I took to be a cellulitis with a thrombophlebitis of the veins of the broad ligament. During the course of her long illness, this area was constantly watched, fully expecting that the mass would break down into pus. Resolution was the termination of this process, however, and the pelvic lesion cleared up weeks before the septic process was finally controlled by the natural defenses of the body.

A very able medical writer of this city defines "fever" as a "dynamic manifestation of a systemic reaction." Fever is a systemic reaction, and in all septic processes its presence should be looked upon with favor, and no attempt should be made to interfere with it. Antipyretics that depress nerve centers which control this systemic reaction, should be withheld. This,

however, does not mean that none of the so-called antipyretic measures should be used in the treatment of sepsis. On the contrary, those therapeutic measures which stimulate the functions of the mechanism of heat production should be freely used. Measures like balneotherapy are antipyretics by their power of augmenting functions, and therefore are beneficial, and at times life-saving. They are supportive and not depressant antipyretic measures.

The cellular tissue about the uterus and in the broad ligament has received an unusual amount of attention from the older gynecologists. One may well inquire why this should have been the case. What train of thought of the older pathologists was responsible for settling their attention on this anatomic area as the seat of diseased conditions, bringing so many ills in its wake in the female economy? Almost every disturbance in the female pelvis of an inflammatory nature was put down as being caused by an inflammation of the cellular tissue. This pathologic state was variously designated as pelvic cellulitis, parametritis, parauterine cellulitis, or periuterine phlegmon. The anatomist of that age knew well enough that the cellular tissue on and about the uterus, was almost a negligible quantity, and why the pathologists should have centered their attention on it, is an interesting query. It is also interesting to note that different countries held different views on this matter of inflammatory affections in the female pelvis. In France M. Augusta Nonat investigated the subject in 1846, and showed by many articles written on the subject, that only a small proportion of cases of pelvic disease is due to cellulitis; that the majority of the cases are diseased states of the uterine adnexa. On the other hand, Great Britain had taught this same doctrine many years previous to the time of this noted investigation of Nonat. With the era of asepsis, of course, came the grand opportunity of investigation, settling effectively the mooted questions of the pathology of these affections. Celiotomy gave opportunity, not alone to investigate the pathology, but pointed the way to the true method of therapeusis of these cases. Asepsis gave the pathologist opportunity to study the lesion *in situ*, as well as in the laboratory and post mortem. Nor has bacteriology played a small rôle in the elucidation of the problem. This science has pointed out that the most important causative agent in this affection is bacteria, and has also shown just how these invasions occur, and the kind of microbe that is most

frequently found in these lesions. That pelvic cellulitis, parametritis and periuterine inflammations do occur, and are definite pathologic lesions, cannot be denied, but that these lesions do not play as important a rôle in pelvic pathology as had been thought is abundantly proven, and such teaching has been accepted. When the lesions do occur they are due to an infection of some part of the genital tract, the perineum, vulva, vagina, cervix or uterus. The reason that pelvic cellulitis has attracted so much attention, is perhaps because collections of pus in this region admit of a ready diagnosis, while the intraperitoneal collections are less readily diagnosticated. Pelvic cellulitis was considered to be the main pathologic entity, other pelvic lesions that happened to be present being considered as complications. In a text book published in 1891, the following is interesting reading in the light of our present knowledge of pelvic diseases. The author says that "Complications of parametritis are endometritis, metrorrhagia, uterine displacements, and as coincident, depending upon the same primary cause, oophoritis, salpingitis and pelvic peritonitis. The occurrence of these complications with cellulitis is so frequent that they may almost be regarded as elements of it when it exists in severity." Our views, of course, have changed. Salpingitis and oophoritis are not complications of cellulitis, but the reverse is true. In the light of our present knowledge of pelvic lesions, the cellulitis that may exist can be disregarded in a large number of cases. If we remove the infection from the genital tract, the cellulitis will naturally take care of itself. A cellulitis that is not due to an infection rarely needs the attention of the medical observer. Its existence is a transitory affair. Non-infective cellulitis doubtless occurs quite frequently, the disturbance being caused by exposure—especially during the menstrual period—but such congestive states subside promptly, after the causative factor is removed. That congestion of the cellular tissue in the pelvis, when often repeated, may finally become chronic, is perhaps admissible, but in such a case no anatomic lesion is demonstrable. If palpable masses are to be found in the broad ligament, an infective process is at hand in some part of the genital tract, or else the mass or masses are of the nature of a new growth. The pelvic cellular tissue is in a position well guarded by other tissues. From within, the peritoneum covers it, and from without, the uterus, bladder and vagina give it protection. Infection can reach it by three

routes. First, directly, by way of a laceration of the cervix of a sufficient extent to reach the cellular structure. Second, by extension of the infection and inflammation from an adjacent structure, and third, by the lymphatic system. The lesion of pus collection from cellulitis, is by far most frequently encountered in the puerperium, and in these cases the infection has occurred by a microbic invasion of the wounds of a lacerated cervix. The infection, however, may have reached the structure from an infected wound of the vagina or perineum, the laceration occurring during labor.

It is with no disrespect to the views of the older gynecologists, but in a spirit of humbleness, mingled with a deep feeling of admiration for their accomplishment, that the above remarks on cellulitis are made. The fathers of the science of gynecology were and are men of genius, veritable "heroes in the strife," when it is considered how hampered in their opportunities for observation they were, by the absence of asepsis, and yet how accurate were their clinical observations—how painstaking their efforts, in giving relief to mothers, wives and sisters.

115 EAST ONE HUNDRED AND SIXTEENTH STREET.

A CASE OF MELENA NEONATORUM.

BY

ANNA E. BLOUNT, M.D., AND STELLA M. GARDNER, M.D.,

Chicago.

A MALE child, weighing ten and a quarter pounds, was born April 16, 1905. The labor was normal, the only notable feature being a short second stage, four rapid and severe pains, completing this stage.

The parents are healthy. The only illness ever suffered by the mother was acute articular rheumatism, complicated by pericarditis, in 1901. Recovery from this illness was complete, unless shortness of breath on mountain-climbing, noticed since that time, is a sequel.

The mother remained well during her pregnancy until February 1, about the middle of the sixth month, when she began to suffer from dyspnea, palpitation, faintness and pain in the region of the heart. The pulse was rapid, remaining above one hundred, and increasing to one hundred and twenty or

one hundred and thirty on exertion. Examination of the heart showed nothing abnormal.

A tendency to bleed from the mucous membrane of the mouth and pharynx was noticed throughout the pregnancy. About the time of the labor, the mother saw a small petechial spot on her arm, and during the next few days four or five other such spots appeared on different parts of the body.

The child was well nourished and vigorous at birth. After the first bath the creases in the skin about the wrists, ankles and axillæ showed small dark lines where slight bleeding had taken place. No further bleeding occurred at these places.

The child slept eight hours after birth, but cried a great deal during the following forty-eight hours. Throughout the third night he cried still more, and would make strenuous efforts to nurse, but never succeed in getting and retaining the nipple without more than half an hour's struggle. Twice only during this night the child succeeded in nursing, after which he slept two hours. The next morning (the fourth day) he nursed after a struggle, and immediately afterward vomited a small amount of pinkish fluid. On examination the roof of the mouth was found to be bleeding. After oozing for a short time, this hemorrhage also ceased.

At noon, a large hemorrhage from the bowel appeared. The blood was black. Bright red blood, perhaps a teaspoonful, was vomited once, and pinkish fluid several times. The hemorrhages from the bowels were repeated every two to six hours, for fifty-six hours, when they ceased and have not recurred. The amount of blood lost at each bowel movement was estimated at from one to two ounces. Not less than sixteen ounces of blood were probably lost in all.

Meconium had been passed in large quantities every few hours, until the appearance of the hemorrhage. There seemed to be griping with each movement, and large quantities of gas were passed frequently. The child was very thirsty and nursed every two hours, until morphine was begun.

The temperature ranged from 99° on Wednesday, April 17, to 100° and 101.6° on Thursday, April 18, and 99° and 98° on Friday, April 19.

The first treatment consisted of gelatine solution by mouth, about one ounce of two per cent. solution given every two hours. At the same time an ounce of this solution was given by the rectum every four hours. The gelatine by mouth was taken

readily, but each administration was promptly followed by griping, hard crying and a bloody bowel movement. After eight administrations, this was suspended, but gelatine per rectum was continued during the entire first thirty-six hours. Also, adrenalin solution (1-1000) m. j. by mouth every hour was given during this time.

On the morning of the second day, on account of severe pain and restlessness, a hypodermic injection of morphine, gr. 1-100 was given. It was obviously an overdose, as it produced profound sleep, slight cyanosis and reduced the respirations from between forty and fifty a minute to between twenty and thirty. The child lay with dry lips and tongue, and could not be roused. During the following twelve hours there were but two movements, both large and bloody, but with less griping. Morphine was repeated in dose of gr. 1-250, twice subsequently. On the morning of the third day the bowel movements, gases and breath were very foul. The temperature was 101.6°. The child, somewhat recovered from the effects of the morphine, had three different periods of apnea, following crying, when cyanosis was extreme and the spinal muscles rigid, after which he lay for some minutes breathless and apparently dead. About this time there were two or three large movements, containing more blood than at any previous time.

All former treatment was now suspended and the bowel was irrigated with lime water and salt solution, in equal parts, half an ounce of the fluid being allowed to remain in the bowel. These irrigations were repeated every four hours. Also, one ounce of lime water was given by mouth, and repeated three times daily with diminishing dose. There were no hemorrhages after this time. The temperature fell to subnormal (normal temperature was regained in ten days), and recovery was rapid.

One and one-half pounds of weight were lost during the first week; the birth-weight was regained in four weeks. Perfect recovery was somewhat hindered by whooping-cough, which the child contracted when he was six weeks old. He is now four months old and weighs fifteen pounds.

Thanks are due to Dr. Effa Davis, of Chicago, for examining the case on April 18, and for suggestions as to the gelatine treatment.

TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

*The President, LEROY BROWN, M.D., in the Chair.
Meeting of December 12, 1905.*

THE GONOCOCCUS IN THE PUERPERIUM.

DR. WILLIAM S. STONE and DR. McDONALD (guest) presented this communication, which was read by Dr. Stone.

He did not think that the relation of this infection to the puerperium had been presented in literature as fully as the importance of the subject demanded. Puerperal conditions could be better understood if some attention was given to the course of the infection before labor. Seitz was of the opinion that after the disappearance of the acute stage of gonorrhea conception could occur, and that a post-conceptional gonorrheal endometritis might be present, at least during the first three months of pregnancy. Bumm and Wertheim thought that the gonococci disappeared with the further development of pregnancy, but that exacerbations might occur after labor from bacteria remaining in the deep cervical glands. Sanger considered a growth of gonococci to be possible during pregnancy because he found them in pieces removed by curettage and had seen small abscesses occur, as a result of which hemorrhages and abortions were not infrequent. Fruhenholz believed the occurrence of acute symptoms in the beginning of pregnancy to be due to the lighting up of a chronic process. This would account for both mild and severe puerperal disturbances in cases in which no vaginal examinations have been made. Noeggerath's opinion of the importance and frequency of this infection in the puerperium was corroborated by Sanger's study of 230 cases in which 15 per cent. had adnexal diseases that could have been ascribed to the puerperium. Steinbuchel studied 328 cases and found the gonococcus to be present in 70, and in three others, in which the findings were negative before labor, the gonococci were identified during the puerperium. Of 274 cases with a normal puerperium, gonorrhea was diagnosticated either clinically or microscopically in 18 per cent. Kronig found that in 296 cases of puerperal fever, a gonorrheal endometritis existed in 31. He called attention to the necessity of excluding other bacteria, and of ascertaining that the fever is not caused by the disease of other organs. The reader related the symptoms as noted by several noted authorities. He then reported 17 cases which were studied in the words of the Lying-In Hospital in 1904 and were collected from 172 cases of pregnancy. Only selected cases were examined for the gonococcus and in suspicious cases repeated examinations were made until positive or negative result could

be obtained. Bacterial examinations were made in all cases of fever in the puerperium, and the taking of intrauterine cultures offered an opportunity to examine for the gonococcus by means of smears. The presence of irregular fever, failing nutrition, and intestinal disturbance in a child was also considered to be an indication for examination of the lochia of the mother. Demonstration of a biscuit shaped diplococcus, of the morphology of the gonococcus and negative to Gram's stain was considered sufficient evidence upon which to base a diagnosis of gonorrhea. It was difficult to differentiate the gonococcus until pus cells appeared in the lochia. Vaginal smears were occasionally successful, but it was found difficult to differentiate the gonococcus on account of other organisms. Acute purulent conjunctivitis in the infant had been accepted in some studies as evidence of gonorrhea in the mother. This was found in our investigation to be fallacious and was only considered an indication for the thorough bacterioscopic examination of the lochia. In spite of all precautions and special care infants in institutions were liable to acquire gonococcus conjunctivitis. A summary of the 17 cases reported showed that the fever began on labor day in three cases; on the first, second, third, fourth, sixth, seventh and thirteenth day in one case each; one case admitted on the sixth day had streptococcus and gonococcus; one case admitted on the eighth day had both streptococcus and gonococcus. Thus out of the 17 cases fever occurred in 12 instances. The maximum temperatures of the 12 mothers was from 100-100.8 in 4 cases; 101-101.8 in 4 cases; 102-102.8 in 1 case; 103-103.8 in 2 cases and 104-104.8 in 1 case. As to the duration of the fever, in three cases it lasted one day; in 2 cases 2 days; in one case 4 days; in one case 6 days; in one case 8 days, and in 2 cases 9 days. In two cases streptococcus and gonococcus were found and in one case colon and gonococcus. The results of this study showed that gonococcus infection was present in a much larger proportion of patients of the obstetrical clinic, than was previously supposed by the writers. This fact was explained by lack of knowledge of the methods of discovery of the organism. The difficulty of cultivation of the gonococcus was one factor in this failure of isolation. Intrauterine or other cultures in cases of mixed infection might show the accompanying organisms, while the gonococcus failed to grow out. The failure to discover the gonococcus by means of smears was explained by the fact that such smears were usually taken early in the puerperium at the time when fever or other morbid symptoms appeared, and were obscured by blood. The positive diagnosis of the gonococcus was difficult in the absence of pus cells, and these did not appear, as a rule, until later in the puerperium. The spread of the gonorrheal infection also increased the ease of recognition of the organism as the puerperium advanced. These facts explained the varying results of other in-

investigators. The temperature curves of those patients having fever were so varied and differed so much from one another that no reliance could be placed upon this, as an aid to diagnosis. One patient had a temperature chart similar to that of an acute streptococcus infection and others showed varying grades of height and duration of temperature. However, the most common type seemed to be that of a sudden rise followed by return to the normal in three or four days, simulating sapremia. The puerperal state had a direct influence upon the course of the disease. Gonorrhea which had been latent before labor commonly spread upward with rapidity during the puerperium. This was shown in the series of cases by the presence of abdominal pain and rigidity in patients, not previously thus afflicted. The presence of these symptoms, when accompanied by fever, was considered to indicate the extension of the disease beyond the confines of the uterus. Thus may be explained many of those cases of salpingitis following labor which are supposed to be the result of puerperal infection. All patients in this series were primiparæ, although a certain number of multiparæ were delivered in the clinic. The tendency of the disease to spread upward and involve the tubes is believed to account for this disproportion. One-child sterility was thus caused by gonorrheal disease.

Gonorrheal disease was a frequent cause of abortion, and in all cases of late abortion this should be considered. Thus, if adnexal disease followed an abortion, it should not be ascribed to the abortion as gonorrheal infection might have been the cause of both.

The writers would not draw any positive conclusions because of the limited number of observations, as to the relation of this infection to nutritional or other disturbances in the children except for the well-known frequency of ophthalmia. The morbidity and the mortality, however, were relatively so great in this series of cases that it seemed probable that there is a relation between the disease in the mother and nutritional disturbances in the child.

DR. J. C. EDGAR.—This subject is most important as well as interesting. In years past I considered gonococcus infection to be a serious matter, but during the past five or six years, after more careful attention, I am inclined to take a different view of the subject. No observations are of value unless founded upon both a microscopical and clinical diagnosis. The clinical diagnosis of gonorrheal infections is not always accurate. Not long ago I was inclined to think that a primigravida or primipara, with a gonococcus infection, had a very serious outlook for the puerperium and that I was justified in giving a bad prognosis. I have in mind three cases where the diagnosis was microscopical; one of these I have been watching for five or six years. She was infected by her husband during her first pregnancy. The child had a gonorrheal ophthalmia. I expected a very stormy puerperium.

The patient had a maximum temperature of 101° F. and had no stormy puerperium and made a good recovery. She went on to a subsequent pregnancy and I again gave a guarded prognosis. She passed through this without any complications and I have failed to find anything in the pelvic organs which might indicate that she has pus there. I agree with the reader of the paper and Dr. McDonald that there seems to be something about the puerperium which stirs up a gonococcus infection. Whether the puerperium itself and the peculiar condition the woman is passing through at this time is at fault, or whether there is a mixed infection from gonorrheal sepsis, from streptococcus sepsis, or otherwise I do not know. But I am inclined to think that these cases of gonorrhea where there results a stormy puerperium are the result of a mixed infection. In Case No. 1 of the reader's this seems to be borne out. Primarily there was a mixed infection. I am in accord with the statistics Dr. Stone and Dr. McDonald have given and which they have quoted from the literature, dealing with sterility from gonorrheal infection. I think that in private practice, where cases can be watched closely, it is more often found. A woman may have one child, then become infected, and subsequently become sterile. Such a case I am treating at the present time. This patient had an active gonorrhea, as attested to by laboratory reports. She remained sterile for four years and in spite of all that can be done for her she still remains so.

The gist of my remarks is that gonorrheal infection in itself does not appear to be a serious matter, and my experience is the reverse of Kimball and Holt. They quote cases of gonorrheal infection conveyed from one child to another in institutions which was followed by local and general peritonitis, virulent forms of infection. I have seen many cases of gonorrhea in children, and several of them I have followed, and I have failed to see that virulent form of local or general peritonitis follow gonorrheal infection of the genital organs. I think that, as has been suggested, in these cases there is some form of mixed infection. The gonococcic infection may be present, but there is as well some other form, showing that it was not a true case of gonococcic infection. This is the position that I take regarding gonococcus in the puerperium. Bacteriologists would not consider these cases the result of a pure gonococcus infection, but a mixed infection.

DR. CHARLES JEWETT.—It is difficult, as Dr. Edgar has intimated, to contribute anything of value to the question except on the basis of definite bacteriological diagnosis. Even in a gonorrheic woman childbed infection may be due solely to other causes than the gonococcus or may be complicated by others. While I would not say that gonorrhea in the puerperium is not a serious matter, it is not a serious factor in puerperal infection. Proof of this is the fact that despite the frequency of gonorrhea in childbed trained obstetricians have almost no death rate from puerperal infection and no grave morbidity. The bad effects of

gonorrhea in obstetric patients are mainly abortion, pus tubes and sterility. Abortion is no doubt more frequently the result of chronic gonorrhea than we had supposed. Williams thinks it accounts for more than 70 per cent. of abortions. How often tubal infection follows the rekindling of an old gonorrhea in the puerperium it is impossible to say from clinical observations alone. We all see numerous instances of one-child sterility in women who had apparently contracted gonorrheal infection soon after marriage. These are examples of recrudescence of chronic gonorrhea in childbed. Yet this does not always happen. I can recall several instances in which I have attended a gonorrheic woman in no less than three successive labors. The frequency of gonorrhea as a cause of sterility, either primarily or secondarily, is variously estimated, the average estimate being not far from 50 per cent.

My own experience with gonorrhea as a cause of fever after labor does not differ from that of others. There is usually a sharp rise of temperature beginning a few days after confinement, but in uncomplicated cases it does not, as a rule, run high, and it soon subsides and all goes smoothly.

Looking over the histories of 31 consecutive puerperal cases, the temperature exceeded 100.5 in five. Of the latter four presented clinical evidence of gonorrhea. In but one did the temperature go above 103° F., and in all it soon became normal.

Sixteen cases selected from a number of histories had what were believed to be gonorrheal secretions. Nearly all of these had feverless childbed. In five only did the temperature exceed 100.5° F., and there were no deaths.

A woman who recently left the hospital nine days after labor had a normal temperature record. The pelvic floor was lacerated and repaired. The child had no ophthalmia, but the eyes were treated at birth with argyrol. At dismissal a smear from the vaginal discharge made by my associate, Dr. Pool, showed the characteristic organisms.

I can recall but one fatal case of probably gonorrheal puerperal infection. The woman, who was seen in consultation, gave a history of recent gonorrhea. The fever began one or two days after labor. The woman died in four weeks, with a temperature of 106. The child had ophthalmia. This was undoubtedly a case of mixed infection.

With reference to the observation of Döderlein, in my experience neither the litmus reaction nor the color of the discharge means much for diagnosis.

DR. EGBERT H. GRANDIN.—In thinking over this subject I must confess that it did not strike me that gonorrhea played much of a rôle in the puerperium. Knowing, as all do, the rôle which it plays in the production of sterility in the production of diseases of the uterus and adnexa which results in abortion, the rôle which it may play in the production of impregnation outside the uterus, I am not, however, surprised to hear it named as a factor in causing

minor disturbances in the puerperal state. At the time when I had the opportunity to observe the puerperal woman more than I now do, it was not customary to make cultures; therefore, I am not in the position from a purely scientific standpoint to say that the gonococcus does not play much of a rôle in the puerperal state. But my own idea is that, as a rule, we are dealing with a mixed infection, the streptococci predominating, the gonococcus being one factor. I look upon the gonococcus more as an agent which leads to the prevention of impregnation than as one which leads to complications in the puerperal state. It appears to me that Case No. 1 of the reader's was one in which he was dealing with a mixed infection, the streptococcus predominating. I would not underestimate the rôle the organism plays in the production of the majority of the pelvic diseases in women; I would not agree with those who think that it is not an agent productive of harm. But so far as my own experience goes, not backed up by any bacteriological tests, I would say that the puerperal state is not likely to be so much influenced by the gonococcus as it is by the saprophytes and the streptococci, one or both.

DR. J. D. VOORHEES.—I regret exceedingly not to have heard Dr. Stone's paper read, but I feel, regarding this subject, much as Dr. Edgar does. A number of years ago I looked upon all varieties of gonorrheal infection occurring during pregnancy with fear, but after seeing so many cases in the hospital presenting the clinical picture of gonorrheal cases with profuse discharge of pus from the vagina, cases with gonorrheal warts, condylomata, vulvovaginal abscess, cases which had undoubtedly contracted gonorrhea after marriage, and after watching these cases go through labor and the puerperium without any temperature whatever, I have changed my former belief. I cannot add anything of scientific value to this subject because at the Sloan Maternity Hospital no methodical bacteriological examinations of suspected cases have been made. The other day I thought it might be interesting to know how many cases of women who gave birth to children with ophthalmia neonatorum, had temperatures during the puerperium. I found 104 cases of ophthalmia, in whose eyes silver in various forms had been instilled at birth. In these 104 cases, when the infection must have been severe as the prophylaxis of Crede failed, only 22 of the mothers developed temperatures. Holt holds that in institutions ophthalmia in children is transmitted from one child to another, but as these cases extend over so many years I believe that all of the babies' eyes were infected from the mother's vagina. Only eight of the mothers developed temperatures earlier than the fifth day, and only two had temperatures over 104° F., lasting a short time. All of these 22 cases got well. One of them developed gonorrheal rheumatism. In view of these statistics, as well as the fact that five cases of vulvovaginal abscess developed no temperature during the puerperium, even though the abscesses were opened a few days before labor, in two of which membranes were retained

and had to be removed manually, in view of all these data, I think that we must change our ideas as to the importance of gonorrheal germs during the puerperium, and must look upon them with less fear. Some of the cases alluded to above developed the temperatures on the seventh, eighth or tenth day. The temperatures came down quickly again, so that a clinical diagnosis of sapremia was made. I believe some of these rises might have been due to the gonococcus. The earlier cases, those which developed temperatures before the fifth day, must have been due to some mixed infection. Also those cases that run temperatures of 104° F. must have been due to mixed infection. Severe cases of gonorrheal infection have been reported. Halls reported a case of fatal gonorrheal endocarditis following labor. Dabney and Harris have reported a fatal case of endocarditis with pure cultures of the gonococcus obtained from the cardiac valves. Jardine has reported a severe case of gonorrheal endocarditis and gonorrheal rheumatism. These severe cases, however, are very rare. Most cases of gonorrheal infection I believe to be very mild, and usually the pathogeny of the microorganism is very low.

DR. R. A. MURRAY.—I think the last speaker has struck the keynote of the situation. Where we have gonorrhea we have a reduction of the power of resistance in the tissues, and a good medium for other bacilli to develop in. This is well shown in the case reported where there was a mixed infection present. In the cases that I have observed I have not had an opportunity to make a bacteriological examination, and therefore I cannot speak on that point; but I have had a large number of cases of gonorrhea in the puerperium, and the labors were not made dangerous because of this fact. In Bellevue Hospital we had an exceptional number of such cases. As long as cleanliness was maintained and ordinary care taken we got good results and only had occasionally a short rise in temperature, which subsided quickly. Those cases got well. But in those cases where we interfere too much, douching or curetting, then we are very liable to have the disease, instead of controlled, prolonged for a long time. In the hospital on the island where there are instances of marked infection absolute cleanliness and care on the part of the nurses keeps down the mortality to about 1 death out of 800 cases. If we see a primipara, or a woman who has not been pregnant for a long period, with a history of a leucorrheal discharge, etc., and where we know the husband has been infected, if you watch these cases through the puerperium you will find, if proper care be taken, that a very small proportion of such cases will develop puerperal disease.

Among the gonorrheal cases that I have had only once did infection of the eye follow in the last three years and the only eye-wash that I used was a solution of boric acid. I do not make use in private practice of any collyrium of silver, which I would do in hospital practice. On the island we had a large number of eye cases, yet, at the same time, the puerperal course was just as good

as in the other cases. Once in a while I have seen cases of severe gonorrheal infection and recently three cases, one of peritonitis and the other two of valvular involvement of the heart. The third case Dr. Grandin saw with me. The husband had gonorrhea, and I was called in consultation for the woman was in a desperate condition, having aborted and being about to die. The condition was directly due to the gonococci. In nearly every case that I have had examined bacteriologically there was no change in the puerperium. Therefore, barring cases of mixed infection, the gravity of the condition seems to have been overestimated. Yet there are not more complications during the puerperium in such cases than in the ordinary cases.

DR. J. RIDDLE GOFFE.—A question occurs to me and the idea was suggested by remarks made in regard to the presence of gonococci in the vagina, favoring the implantation and development of virulent microorganisms. Dr. Marx believes that their presence inhibits the antiseptic powers of the vaginal secretions. Dr. Murray goes further and states that their presence develops a favorable culture medium for concomitant infection. I should like to ask if any laboratory experiments have been made to show that cultures invaded with gonococci facilitate the development of such germs as streptococci and saprophytes.

DR. A. M. JACOBUS.—I desire to ask Dr. Stone whether any gas forming microorganisms were found in the cases examined. Recently I have had several cases at the Presbyterian Hospital dispensary gynecological clinic which looked like the worst forms of gonorrheal vaginitis. Smears were made and sent to the laboratory of the hospital for examination, and the reports returned said that no gonococci were found, but gas forming microorganisms and diplococci resembling the gonococcus were present. These produced the symptoms resembling gonorrhea. Possibly this might account for some of the cases of mixed infection reported. I see many women in the clinic with the old story, that their husbands "had a discharge from their privates" due to a "strain," or which they had not caught from their wives, and yet no gonorrheal microorganisms were found in the vaginal secretion. In other words, judging by the amount of gonorrhea in married men, suggesting that gonorrheal infection in women is less frequent than one would suppose from the number of exposures. I believe, with others, that a mixed infection is the cause of the virulent infections of the puerperium. Laboratory provings, however, as the paper states, is a better guide than clinical histories and appearances.

DR. R. H. WYLIE.—I have had a number of cases during the past year examined where previously gonorrhea would have been considered to be present from clinical symptoms. Yet after several examinations by good and competent men no gonococci could be found. Therefore, it looks as though we must revise our ideas as to the presence of gonorrhea from clinical symptoms alone.

DR. RALPH WALDO.—I should like to ask Dr. Stone a question.

He spoke of patients with unquestioned gonorrhea giving rise to ophthalmia of short duration in but three instances. I should like to ask him if the Crede method was used in the infants at the time of birth. When I was on the house staff at Charity Hospital whenever a patient had any severe venereal disease she was sent to the venereal wards, and these cases were bad cases, but it was remarkable that almost invariably they did well.

DR. McDONALD (guest).—In this study one of the most important things brought out is that the gonococcus in pregnancy and puerperium can with difficulty be isolated until late in the puerperium, *i.e.* cultures taken at the time of labor or shortly after contain no gonococcus. The reason for this is that it is difficult to cultivate. Every little while one sees a new kind of medium which is vaunted for cultivation of the gonococcus; all have been used, and the various kinds have been discarded by most men. Personally I have very little success in cultivating the organism in this stage. In three of our cases failure could be ascribed to an overgrowth of other microorganisms. The gonococcus in this study was obtained at various times, but before the fifth day of the puerperium in comparatively few, only one case out of 17. In most cases the gonococcus was not obtained prior to the sixth day. Smears were not taken every day. In the early days the presence of the hemorrhage in the lochia made it difficult to find the organism; the infection localized in the cervix had not had a chance to spread; so, because of the blood cells in the lochia it is almost impossible to recognize the gonococcus in the smears. In the absence of pus cells the recognition of the gonococcus is difficult. There are other cocci sometimes found in the vagina that closely resemble the gonococcus morphologically. One in particular has the same staining properties and differs from the gonococcus, in that it is not, as a rule, intracellular. So without the presence of pus cells, or leucocytes in the lochia, it is almost impossible to diagnose the gonococcus absolutely. For years all studies which have been made on the comparative estimation of the infecting organisms in the puerperium must necessarily have been open to the objection that they were not complete. Williams' studies are interesting. In 150 cases he found the gonococcus in but 8 cases. Curiously enough in the December number of the *AMERICAN JOURNAL OF OBSTETRICS* Little, in the same class of material, found gonococci in an examination of 50 consecutive cases 16 times. It was interesting to note that this study of Little bears out our own studies. Of 50 routine cases of pregnancy examined at various times during the puerperium the organism was found 16 times. Bacteria of other than gonorrheal nature was found 20 times. In the 16 cases the gonococcus was found in pure culture 12 times; in mixed culture 4 times. In our own series the gonococcus was found in mixed culture 3 times, and in pure culture 6 times. The rest of the time vaginal microorganisms were found that were not considered to be pathogenic. In view of these findings of Little, the gonococ-

cus in pure culture 12 times and in mixed culture 4 times, it cannot be with justice said that the presence of the gonococcus in the puerperium, in the uterus or vagina, or both, favors the growth of other bacteria. This is a subject in which definite evidence alone must be admitted, and in which clinical evidence is practically useless. In one of our cases there were so-called gonorrheal warts, condylomata, and we were not able to find the gonococcus even after persistent search. Evidences of gonorrheal urethritis in the husband is only presumptive evidence of the disease in the woman, and we cannot admit any evidence regarding this disease unless bacteriological methods have been employed. Not only that, but we must have evidence from a pathologist who is experienced in this work. Again I repeat we do not feel justified in stating that the gonococcus in the uterus or vagina during the puerperium predisposes to the growth of other organisms.

With regard to the severity of the gonococcic infection, it was, as a rule, of a mild grade, *i.e.*, without high temperature. But because of any lack in severity during the puerperium we cannot be assured that the infection itself is not a serious one. It is well known that infection with the streptococcus leaves little after-effects; but this cannot be said of the gonorrheal infection with the same truth. It may result in a salpingitis or a pelvic peritonitis after the puerperium is past.

With regard to the severity of the mixed infection, there were two cases of the gonococcus and the streptococcus. In one case the infection was very severe and the patient died; the other case was a mild one. The severity of the infection depends upon the extent of the anatomical lesions. The same thing holds good in regard to the presence of the gonococcus in the vagina, in the cervix or in the uterus; it depends to a great extent upon the anatomical extent of the infection. So many cases seem to run a mild course.

If the gonococcus is obtained in pure culture it does not necessarily mean the case is a mild one. Mann reported such a case, with death following a peritonitis from which the gonococcus had been obtained in pure culture. Due to Dr. Barrow's courtesy I was able to see one woman who died from peritonitis in the puerperium, from which a pure culture of the gonococcus was found. Therefore these cases, with ours and those reported by Little, show that while the infection is, as a rule, mild, there are occasionally severe cases.

The question of fever brings back the old query, What degree of temperature may be taken as a criterion? In Little's cases 100.6 was taken, while in our cases 100 was taken as the standard. Of Little's cases, 16 in number, 3 were over 100.6, and 10 of them had temperatures over 100. This bears out our statement with regard to the severity of the infection. The characteristic type of fever in such disease is certainly that of "sapremia," so-called.

With regard to any disturbances in babies we have hesitated to draw any conclusions because the study is small and the

data limited; we feel, however, that we are justified in directing your attention to this. We leave the study of the transmission of the toxins from the mother to the child to those with better opportunities for the work.

DR. W. S. STONE.—It is a mistake to consider that the authors of the paper have attempted to prove that the subject is more important in the puerperium than it really is. We have not tried to show that the presence of gonococci frequently causes a fatal puerperal disease; in fact, we know it is rarely fatal. The first case undoubtedly died from a streptococcus infection, but it clearly demonstrates the different ways in which the two infections advanced; one the gonococcus, by the direct continuity of mucous membrane; the other, the streptococcus, through the blood-vessels and lymphatics of the broad ligament. In this way the streptococcus causes a suppurative salpingitis, especially of the outer part of the tube, that later gets well. The gonococcus, on the other hand, causes salpingitis in the puerperium that subsequently results in a pyosalpinx. Its presence, although often ascribed to a puerperal infection, is almost invariably due to the gonococcus.

The authors also wished to note the importance of the point, illustrated by the case of Dr. Marx, in which a gonococcus rheumatism developed after curettage of an apparently sapremic case. It is a fact that these mild cases of gonococcus infection simulate in time of appearance and duration of symptoms the sapremic type, and even the mechanical stirring up of the organisms is a frequent cause of the complications.

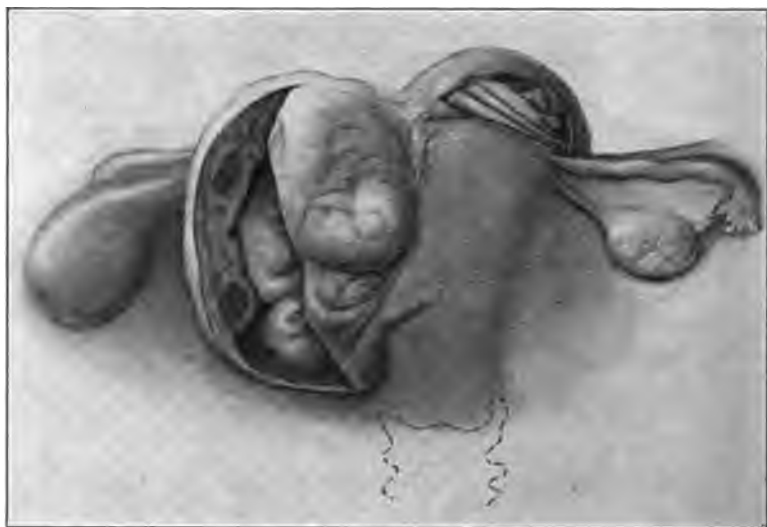
The Crede treatment of the eyes of the children was carried out as a routine measure.

DR. H. J. BOLDT presented a series of specimens as follows:

DOUBLE EXTRAUTERINE PREGNANCY.

This patient was 35 years old, married 15 years, and had had two children, the last 14 years ago. She was sent by her physician because of the presence of nearly constant bleeding for the past few weeks, and it was assumed both by the patient and her physician that she was pregnant about four and a half or five months. It was requested that I should decide whether it would be advisable under the circumstances to empty the uterus. On examination the uterus was found to be somewhat enlarged and relaxed in consistence. It was pushed forward, slightly to the left of the median line and practically immobile. Behind the uterus a mass was felt, globular in shape, very sensitive to touch, and about two and a half inches in diameter. Inseparable from this mass, and also in direct connection with the uterus, there was an elastic tumor corresponding in size to a five-month pregnant uterus; this is shown at the operation to be adherent coils of intestines, covered by inflamed, thickened and adherent omentum. On the right side of the pelvis, also close to the uterus, there is another tumor which does not extend above the brim of the pelvis. Being sure that the uterus did not contain a fetus, a sound was intro-

duced, and the cavity measured three and a half inches. Further questioning elicited the fact that the patient had had a sudden attack of severe pain on the 19th of April. The pain was most intense in the right iliac fossa. At present there is some pain in the left side. The diagnosis of secondary abdominal pregnancy was made, with the presumption that the primary rupture, or a short tubal abortion, occurred on April 19. She was admitted to my service in St. Vincent's Hospital and operated on June 2. The patient looked very anemic and had marked leucocytosis. After separating the omentum and intestine which composed the large tumor previously felt, a tumor which was thought to be placenta was found adherent to the posterior surface of the right broad ligament; above it was the thickened Fallopian tube and ovary. This



Double Extrauterine Pregnancy.

mass was very adherent throughout to the intestines. Behind the uterus, and extending somewhat above the fundus, there was a hard globular tumor, which from its bony contour was considered to be the fetal head. The capsule, or rather the bony structure, was accidentally opened while endeavoring to enucleate it from the surrounding adhesions, and thick, creamy fluid escaped. There was no odor to it, and it was thought to be broken-down brain tissue. All the skeleton bones were encapsulated in what appeared to be the skull, and were arranged on top of each other like cordwood. The large intestines were extensively injured during the separation of the adhesions, but were sutured without requiring resection. This fetus was probably the product of a left tubal conception, as the thickened, inflamed Fallopian tube indicated. Both ovaries were retained and attached to the cornua of the uterus,

although the glands were enlarged and inflamed. The large oozing surfaces required tamponing with a Mickulitz tampon, and the abdomen was closed except at its lower angle, where the tampon protruded. The patient made a slow recovery because of a fecal fistula, which, however, closed spontaneously. It was subsequently shown that I was in error about what was supposed to be placenta. This mass contained another fetus about two and a half months' gestation, according to the pathological report. This is the second double tubal extrauterine pregnancy which I have had the opportunity to operate upon this year. The woman is now in excellent health.

PAPILLARY CARCINOMA OF BLADDER. RESECTION OF AREA WITH THE VESICAL END OF THE URETER.

The patient was 50 years old. Her chief complaint is hematuria and pain in the left renal and ureteral region. Seven years ago the patient had an attack of hematuria which lasted two weeks. Three years later there was another attack. Then there were six months in which she was free from bleeding, when another attack occurred. Since then hematuria occurred at varying intervals. During the last four months there has been nearly constant hematuria. At times clots of blood were passed. The urine drawn with a catheter is bloody.

Cystoscopic Examination.—A papillomatous tumor, about the size of a pigeon's egg on the left lower part of the posterior bladder wall, close to and covering the ureteral orifice. A great part of the outer circumference of the tumor is necrotic, and shows areas from which hemorrhage has occurred. The urine flows clear from the left ureter.

Diagnosis.—Vesical papilloma, probably carcinomatous.

Operation was performed on August 25, 1905. An abdominal section was made. The bladder was opened near the fundus and the diseased area was excised with a zone of apparently healthy bladder wall, including the vesical end of the ureter. The ureter was then exposed in the pelvis and reimplanted into the bladder. The end of the ureter was split, and in each lateral part a silk guide was placed, and these were brought out through the urethra and fastened, so that about an inch of the ureter projected into the bladder. A permanent catheter was introduced and a gauze drain placed in the lower end of the abdominal wound. The rest of the abdomen was closed. Uninterrupted recovery followed. Since the operation there has been no hematuria. Since the patient left the hospital, however, she has complained of frequent micturition, followed by tenesmus.

A cystoscopic examination on October 30 reveals inflammation about the area originally involved by the tumor. A stone soft and friable is present which breaks easily upon touch with the beak of the cystoscope. It is of high white color. Microscopical examination of the stone shows it to be composed of triple and amorphous phosphates, amorphous urates, and uric acid crystals.

On December 5 the history shows that she has had recently symptoms as before. There is no more blood. The urine is pale and turbid. The cystoscope reveals a new stone at the site of the old one. It is elliptical and white. It is movable, but cannot be entirely displaced from its situation. It is friable, but does not entirely break through. There is inflammation as before. When seized with a lithotrite the instrument cannot be completely rotated. The jaws seize a soft mass which is removed with the lithotrite. The control cystoscopy shows a mass to have occupied the site of the ureteral implantation. Only necrotic fragments are left after removal of the stone. The ureter is visible as a large round orifice.

Histological Examination.—There is found necrotic tissue (intravesical and of implanted ureter) with calcareous formation—triple phosphates, amorphous phosphates, but chiefly uric acid, amorphous urates and calcium carbonate. The urine contains a trace of albumin, but no casts. There are a few epithelia from the ureter and convoluted tubes.

The pathological report from the practitioner's laboratory of the specimen which was removed by abdominal section states it to be a papillary carcinoma of the bladder, with no invasion of the periphery of the removed bladder wall.

**RUDIMENTARY FALLOPIAN TUBES — INTERSTITIAL SALPINGITIS
WITH NEARLY COMPLETE OBLITERATION OF THE TUBAL LUMEN.**

The patient was 30 years of age, whose menstruation began at the age of 16 years, and who had been regular at intervals of four weeks, of two days' duration, very small quantity of blood at each period. She has always suffered most excruciating dysmenorrhea. Three years before being sent to me she had had a dissection of the cervix and a curettage done by another gynecologist. She was not in any way benefited. On examination the uterus was found to be smaller in size than normal. The organ was held in a position of retroflexion by dense adhesions. The adnexa could not be positively palpated because of very thick and rigid abdominal walls. The right ovary only could be palpated. It was enlarged and collapsed.

An operation was performed on October 18, 1904. The adhesions holding the uterus backwards were very firm. Both Fallopian tubes were very thick and hard. They protruded from the uterine cornua like a knob about one and a half inches long. The ovaries were both enlarged and cystic. In the right broad ligament was an intraligamentous cyst about the size of a small hen's egg. This was enucleated. Both Fallopian tubes were resected, including their interstitial parts. The ovaries were transplanted into the gap thus made. The pathological report stated the entire length, inclusive of uterine cornua, to be two inches, with a diameter of three-quarters of an inch. The lumen was very narrow, scarcely the diameter of an ordinary pin. It was lined with a single layer of columnar flattened epithelium which was more or

less eroded. The walls showed chronic inflammation. The specimen, which was very interesting, had not been previously reported upon because it was desirable to report also upon the condition of the patient as the result of operation. This has been most satisfactory. Menstruation has continued to be of the same type as to time, duration and quantity, but absolutely painless. The young woman has been able to take up a vocation of an arduous nature, and has not had an ache or pain since she was operated upon.

HYSTERO-SALPINGO-OOPHORECTOMY FOR BILATERAL PYOSALPINX AND OVARIAN ABSCESS.

The patient was 33 years old, and had been married five years and had had three children, the last one one year ago. From the history it seems that the woman was infected with gonorrhea during her pregnancy, although no gonococci were found at the time of examination before operation. She had complained of constant abdominal pain since the birth of her last child, more especially in the right iliac fossa. The diagnosis of chronic suppurative salpingitis was made. Because of diffuse form intestinal adhesions the operation was technically difficult and the bladder was extensively injured, for the repair of which two layers of sutures were used. The pathological examination did not throw any light upon the question of gonorrheal infection, showing only the usual changes of suppurative salpingitis and chronic ovaritis with an independent abscess of the ovary on one side. The uterus showed nothing but the presence of glandular endometritis.

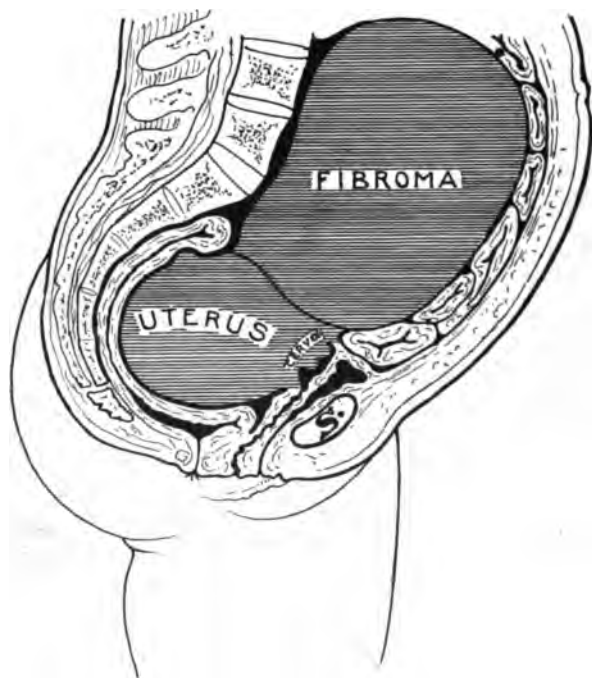
UNILATERAL TUBOOVARIAN ABSCESS.

The patient was 29 years old and had been married seven years, but never pregnant. Since her marriage she had suffered from intense dysmenorrhea and profuse menstruation and pain in the lower abdomen. During the three weeks prior to operation the pain in the right iliac fossa had become unbearable. Eighteen months ago she had been operated upon for appendicitis by a surgeon of excellent reputation. The pelvic adhesions were extensive, and although the left tube and ovary were evidently also inflamed, yet the inflammatory process did not seem of sufficient intensity to justify their removal. Since operation the patient has been free from pain. It is probable that the tuboovarian abscess was present at the time of the appendicitis operation, but that the pelvis was not explored at that time, and consequently the pelvic disease was overlooked. The cause of the acute exacerbation three weeks ago is not clear.

HYSTERO-SALPINGO-OOPHORECTOMY FOR CHRONIC METROENDOMETRITIS AND SALPINGO-OOPHORITIS.

The patient was 30 years old, supposed to have been infected with gonorrhea during her first pregnancy. There had been three

abortions, the first one occurring three weeks after the presumable infection. The patient has never been well since, having had numerous attacks of recurring pelvioperitonitis. Three weeks previously another attack began and the patient failed in health from day to day, suffering most intensely without intermission, unless her physician gave narcotics. No evidence of gonococci was found. The uterus was found immobile because of an exudate behind it. On operation a separate abscess was found between the right ovary and the surrounding adhesions. The left tube and ovary were imbedded in the exudate. The technique



Myoma Complicating Pregnancy.

presented the difficulties usually found in this class of severe abdominal operations. Recovery was uneventful. She has not felt as well in years.

Pathological Report.—The uterus was small, round, of flattened, triangular shape, $2\frac{1}{2} \times 2\frac{1}{4} \times 2$. The cavity was narrow, the wall smooth, the cervical wall of a dark brown color. The wall of the uterus was about one inch thick. The ovaries and tubes were matted together on each side, forming irregular tumors $2 \times 2\frac{1}{2}$ inches long. The walls of the tubes were much thickened. The ovaries were cystic.

Microscopical Examination.—The connective tissue of the body of the uterus and the cervix was markedly increased. Among and between the muscle bands were broad taberculæ of loose cells of the fibrous type, and the whole wall was infiltrated with a moderate number of lymphocytes. The mucosa was eroded and ragged, the endometrium congested and infiltrated, the glands were swollen and filled with detritus. There was a chronic inflammation. The tubes presented the features of suppurative acute and chronic salpingitis. The ovaries were congested and had the appearance of chronic inflammation, containing many large follicular cysts, the contents being mostly blood or detritus.

ABDOMINAL HYSTERECTOMY FOR MYOFIBROMA — DEATH FROM MYOCARDITIS.

The patient was first seen December 14, 1902. She was then 37 years old and had been married 14 years, and had never been



Myoma Complicating Pregnancy.

pregnant. Her menstruation had been regular until 1900, when it began to become profuse. She was curetted by a gynecologist with but temporary relief from the menorrhagia. Since curettage the patient had had much pain in the lower abdomen. The diagnosis then made was interstitial myoma, complicated with pyosalpinx. Operation was advised. She was not seen again until November 17, 1905. She had had local treatment from various physicians without effect. The fibroid had increased in size and the woman was suffering from local peritonitis. She maintained that she had not been without pain in the lower abdomen for several months. Operation was again advised and

accepted. The heart and kidneys did not show any pathological changes. The operation done November 30 was complicated by diffuse intestinal adhesions to the fibroid uterus and to the pyosalpinx. The operation was nearly completed when the pulse suddenly became very, very slow, and a few moments later stopped entirely.

Pathological Report.—The heart was rather small in size and firm. The exterior was covered with a fairly large deposit of fat. The aortic and mitral valves were thickened, and the latter showed some yellow, atheromatous plaques. The intima of the aorta showed a few yellow plaques, the size of a split pea. The pulmonary valves and tricuspid valves could not be examined since torn away. The heart muscle was pale and fairly firm; the ventricles were empty but not dilated; the papillary muscle was fairly normal and the coronary vessels were not obstructed. The lungs presented nothing abnormal. The kidneys were not enlarged, were dark in color, with adherent capsule, and were smooth, with a congested surface. On cut section the cortex showed indistinct markings and irregular outlines. The apices of the papillæ were pale. The pelvis showed nothing abnormal. Diagnosis was made of atheroma of the aorta and mitral valves, with fatty degeneration of the heart. There was also a parenchymatous and interstitial nephritis.

The protoplasm of the heart cells stained poorly, but the nuclei were very clearly defined. The connective tissue between the fibers was slightly increased, particularly about the vessels. The amount of fat beneath the pericardium was very much increased, and the vessels here showed thickened walls, chiefly due to hypertrophy of the media. Here and there there was a distinct infiltration of the lymphocytes between the fibers. A diagnosis was made of interstitial and parenchymatous myocarditis.

MYOMA COMPLICATING PREGNANCY.

This case was operated upon at the end of the third or the beginning of the fourth month of pregnancy because the large tumor forced the uterus into the true pelvis, and in this instance dislocation of the tumor into the abdominal cavity would have been a physical impossibility. The patient, although this was her first pregnancy, expressed a wish to have the uterus and tumor removed. The adnexæ were retained. The patient was operated upon on the 12th of October and was out of bed on the 13th, or within 24 hours, and she remained up every day, and walked about a little. During the night of the fifth day the woman had a severe attack of bleeding; the blood oozed through the opening of the stump of the cervix; it was so profuse as to require a firm tamponade of the vagina by Dr. Emans, the patient's family physician. Dr. Boldt mentioned this, not because he had any reason to believe that the early getting out of bed had anything to do with this, but he thought it his

duty to report everything unusual. The source of the bleeding was uncertain; it did not, however, interrupt the recovery in any way, because the patient was about attending to her household duties two weeks after operation.

MAJOR MONSTROSITIES AND POLYHYDRAMNIOS.

DR. J. B. COOKE.—In presenting these specimens of anencephalus and of cleavage of the superior maxilla and of thoraco-abdominal cleavage to the society my only object is to call attention to the frequency with which polyhydramnios associated with major degrees of monstrosity. That this fact is well known to my hearers there can be no doubt, but not enough emphasis is laid on the relation between these two conditions in the text-books. The cases reported here have occurred within the past year in my practice, together with two other cases of minor degree, not worth reporting, but of serious moment to the parents of the unfortunate child. In all of these cases I have, on account of the polyhydramnios, predicted the probability of some malformation in the fetus, and this prediction, which has proved correct in every case, has seemed to be of great comfort to the parents in their disappointment. I feel, consequently, that the society may well call the attention of the general practitioner to the close relation which exists between these conditions.

TRANSACTIONS OF THE WOMAN'S HOSPITAL SOCIETY.

Meeting of October 24, 1905.

The President, DR. P. F. CHAMBERS, in the Chair.

PUS COLLECTIONS IN THE FEMALE PELVIS.

DR. BISSELL.—The case I report bears directly upon the subject of the paper of the evening and is of special interest because of the fact that there are shown two distinct foci of pus which are in no way dependent upon or related to each other. The patient was a woman 25 years of age, unmarried, but with the history of a probable miscarriage some years ago. Attacks of pain throughout the pelvis were more or less frequent and severe. There was a slight elevation of temperature; a mass could be felt in the pelvis, and there was considerable tenderness in this region. On opening the abdomen, I found the intestines, tubes, ovaries and uterus agglutinated, each tube containing pus. In the region of the appendix, and entirely separate from the pelvic area, excepting for a few thin inflammatory bands, there was another agglutinated mass of intestines, surrounding what appears to be a parovarian cyst the size of an orange and the appendix firmly attached to its wall. The focus of pus in that region was undoubtedly the appendix and altogether independent of the inflammatory condition about the tubes. The cyst had in some way become separated from the pelvic structure and wandered about the cecum.

DR. HARRISON mentioned an instance bearing out the dictum that one can palpate so hard that one cannot feel at all. The case was one of large parovarian cyst which had been overlooked by the physician in a sanatorium.

DR. PINKHAM.—I have two specimens of fibroids of the uterus quite similar but differing in their pathological aspect. The first case was operated on by me last June. The patient was 42 years old, had one child, four miscarriages, and had been married sixteen years. She began to bleed in April and flowed constantly up to the time that I saw her. She had lost flesh and was constipated. The other woman was 41 years old, and had been married twenty years. The oldest child

was 16 years of age. She had had five miscarriages, two since the birth of the last child, twelve years ago. She had no symptoms which led her to be examined. Six months ago she began to have menorrhagia about the time of her periods, until July, when she began to flow steadily. Her symptoms had been intense pain, especially on the right side, bearing down sensations, constipation, loss of flesh, appetite, etc. The physical examination led me to believe she did not have a carcinoma but a fibroid, about as big as two fists. The other woman had practically the same thing, except that I could feel the adnexa on both sides. I removed the tubes and ovaries. The uterine wall was very much thickened and there was a small subserous fibroid. I made a circular abdominal incision and removed the tumor. The pathological report proved it to be a sarcomatous degeneration of a submucous fibroid. This specimen is simply a submucous fibroid. Both cases were abdominal section with the curved incision, within an inch of the pubes. The patient to-day shows no scar.

EPITHELIOMA OF CERVIX WITH INVOLVEMENT OF PELVIC GLANDS;
INCOMPLETE OPERATION, IMPROVEMENT IN SPITE OF
CONTINUED ENLARGEMENT OF PELVIC GLANDS.

DR. BROWN.—A patient presented herself in my office a year ago giving a history of profuse bleeding and requesting that I perform a curettage which had been advised by another physician. My inability to make an examination at the time and her haste to have the curettage were the reasons of undertaking the operation on the following day without any previous examination. The condition found at the time was a large cauliflower mass involving the cervix. After its removal the uterus was seen to be freely movable with no apparent involvement at the base of the broad ligament. The pelvic lymph nodes on both sides were enlarged in some instances to the size of an egg. The microscopic examination verified the diagnosis of epithelioma. A week later a thorough operation was undertaken, the vagina was dissected up for an inch around the cervix and united over the cervical stump. The abdomen was opened with the intention of doing a complete hysterectomy and removing all enlarged lymph nodes. The involved glands were found to be more numerous and were more firmly fixed than could be appreciated by feeling. The pulse and general condition showed the inability of the patient to withstand the operation. The abdomen was closed and a high amputation of the cervix was done, involving a removal of the dissected vaginal portions. Though the operation did not consume over thirty minutes, the pulse of the patient was hardly perceptible when she was placed in bed. For the first six months following the operation her pulse was of very poor quality. At first there was considerable pelvic pain apparently referable to the diseased lymph

nodes; this pain was controlled by cannabis Indica. These lymph nodes steadily increased in size. At present, one year after the operation there is no recurrence in the site of the cervical amputation. The patient has no pain, the pelvic lymph nodes have increased in size, in some instances to that of an orange; the uterus is still quite movable, being apparently restricted in its mobility by the surrounding enlarged glands. There has been no loss of weight. The pulse is, though poor, of better quality than six months previous. The patient sleeps and eats well.

DR. MALLETT.—A case which was sent to me a week ago had some fluid in the abdominal cavity and had lost twenty pounds in weight in three months. The only thing I could find was an enlarged ovary on the right side. I thought then it was either a carcinoma of the ovary or a tubercular peritonitis. Before operating I noticed that she was somewhat jaundiced, so I made an incision around the rectus muscle. I found the liver not very much enlarged, but extremely hard. If it had not been for the jaundice an incision would have been made below the umbilicus.

DR. GRAD.—In Dr. Bissell's case there were apparently two distinct foci of pus in the pelvis. One was appendicitis and one inflammatory infection of the uterine adnexa.

DR. BISSELL.—The foci of pus seemed to be entirely independent as to origin. There were thin spider-web inflammatory bands connecting them, but not of a character to make me believe they were in any way dependent upon each other.

DR. GRAD.—Within two years two papers have been read before our Society on the subject of sarcomatous degeneration of uterine fibroids. If I remember right, Dr. Graves of Boston reported a series of microscopical investigations of thirty-three fibroids, and he found that something like 9 to 10 per cent. of these cases had sarcomatous degeneration in the fibroid. If that is so, the fact must be put down as a cause for the removal of a fibroid.

DR. BROWN.—If we permit the last speaker's remarks to pass without question the impression produced would hardly be a fair one. Graves examined at his first report thirty-three fibroid tumors in which three were found to be sarcomatous or less than 10 per cent. His subsequent examinations, a year later reduced the percentage of sarcomatous findings in fibroids to less than one per cent. Even this is higher than generally accepted, the percentages being nearer one-half of one per cent.

DR. GRAD.—I think that the recent investigations on this point the Doctor has brought out are these: that the fibroid in some way causes blood changes which in turn is responsible for myocardial degenerations. This is thought to be so because a great number of unexplainable deaths occur in fibroid cases and the only way to account for them would be on the basis of myocardial degeneration. Whether this is a fact is difficult to decide, but so frequent are the sudden deaths in fibroids associated with

myocardial degeneration that there seems to be some relation between these diseased states.

DR. HARRISON.—The cause of these myocardial changes is solely hemorrhage. Baldy, in the extensive paper he read before the Obstetrical Society, mentioned some cases which had degenerative changes in the heart, while the fibroid tumor was small. This has been so in the cases that I have seen. I have had the misfortune to lose several cases in that way; they have all had extensive hemorrhage, which would easily account for the degenerative changes in the heart and blood vessels, tendency to thrombosis and pulmonary embolism and brown atrophy of the heart.

DR. BROWN.—I cannot exactly concur in everything that Dr. Harrison has said. It is well recognized that in instances of excessive hemorrhages associated with fibroid tumors, the heart muscle undergoes changes of a fatty character. Other changes take place at times in the heart muscles, in the presence of fibroid tumors, independent of the existence of hemorrhages. Wilson of Birmingham, Eng., in a paper a year ago, described at length among others, three cases in which the tumors were small and where no marked hemorrhage existed. In each there were hypertrophy and dilatation of the heart. The cardiac condition was improved by the removal of the tumors. Fleck, in an exhaustive article, reports twelve sudden deaths associated with fibroids; in nine, no hemorrhages existed. The post-mortem examinations showed brown atrophic myocardial changes. In the remaining three in which hemorrhages had been present, fatty degeneration of the heart muscle predominated. Hofmeyer collected eighteen sudden deaths associated with fibroids, in which fifteen showed brown atrophy of the heart muscle and three fatty degeneration. Baldy in a recent article reports that in studying the reports of the Gyncecan Hospital for the past eighteen years, he finds that sudden deaths have occurred in three-fifths of one per cent. of patients having fibroid tumors, while for all other conditions two-tenths of one per cent. represents the sudden deaths. With these facts it is but reasonable to consider that the existence of fibroid tumors cause myocardial changes in the heart; and that the safer course is to remove such tumors when they are found.

DR. CHAMBERS.—The second case of Dr. Pinkham shows the advantage of a thorough diagnosis before the operation. In that case the fibroid could be removed, and the uterus saved.

DR. GRAD.—Dr. Brown's case shows a very unusual result in a malignant case. There are a variety of epitheliomas some simply of a local nature; that is to say, not spreading so much as another variety does. The microscopical appearance of these epitheliomas is different. It has been stated that some epitheliomas are readily cured while others are not amenable to therapeutic measures. A number of remarkable cures by the x-ray have been reported, but some epitheliomas will not respond to

that therapeutic measure at all. It may be that this case of Dr. Broun's is one where the epithelioma was simply a local process.

It must be remembered that not every enlarged lymph node in the vicinity of a malignant process is due to a metastatic deposit. If the enlargement is due to a metastatic process the node will break down. Microscopic examination of a chain of lymph nodes may show a metastatic deposit in two nodes with no such lesion in an intervening node.

DR. H. GRAD read a paper on

PUS COLLECTIONS IN THE FEMALE PELVIS.*

DR. HARRISON.—I think that a great many American writers deny the occurrence of cellulitis. It is a curious fact that in Baldy's book, for example, not a word is written about the inflammation of connective tissue in the pelvis. The modern writers go further in their partisanship than the writer did and make a fearful blunder when they ignore the existence of inflammation in the connective tissue of the pelvis. There is one way pus may start in the broad ligament that the writer does not mention, which the history of the following case will illustrate. This patient had a tumor which had been wrongly diagnosed as one of the ovary. At the operation I discovered fluid in the abdomen under so much tension that it shot up nearly to the ceiling. The tendency of these growths is to extend down into the broad ligament. I extirpated the tumor thoroughly and thought that would be the end of the trouble. Microscopical examination of the tumor showed a tendency to sarcomatous degeneration. Some time afterwards I left the patient in the hands of my son, who called a consultant and they thought that she had then a carcinomatous growth adjacent to the uterus. The case proved to be an infiltration into the connective tissue of the pelvis, the mass being so hard that it simulated very closely the nodules of carcinoma. This infiltration worked its way up into the posterior portion of the broad ligament, along the iliacus muscle, the induration appearing at the buttock. I treated her then and it healed. The case was undoubtedly an extraperitoneal collection of pus from a broken down tumor that invaded the broad ligament.

DR. BISSELL.—I am in sympathy with most of what has been said in the paper, but do not think sufficient stress was placed on pus in the pelvis from appendicitis. Another condition still more rare, is pus collections between the endometrium and the uterine wall due to infection of the endometrium by diphtheritic germs.

DR. PINKHAM.—There are often cases of salpingitis without vaginitis. I believe a great many of these cases spread by the lymphatics.

*See original article, page 239.

DR. GRAD.—I am very much obliged to Dr. Harrison for the report of the case. I had mentioned that infections may appear in the gluteal region by way of the sacrosciatic notch, but I did not state that the pus may start as a result of a growth breaking down in the layers of the broad ligament. Regarding Dr. Bissell's remark, I had mentioned that appendicitis was a source of pus collections in the pelvis, but I did not dwell upon it enough.

TRANSACTIONS OF THE SOUTHERN SURGICAL AND GYNECO- LOGICAL SOCIETY.

Proceedings of the Eighteenth Annual Meeting, Held at the Seelbach Hotel, Louisville, Ky., September 12, 13 and 14, 1905, under the Presidency of DR. LEWIS C. BOSHER, Richmond, Va.

After the transaction of routine business, the reading of papers was begun.

DR. I. S. STONE, of Washington, D. C., read a paper entitled

WANDERING OR ABERRANT RETROPERITONEAL FIBROID TUMORS OF UTERINE ORIGIN.

Among other things he stated that these tumors must reach the space behind the peritoneum by way of the broad ligament. This route was the only one open, and was necessarily followed by every fibroid which escaped into any part of the retroperitoneal space, however remote. After a fibroid became well separated from the uterus, it usually remained in the broad ligament indefinitely, and would always do so unless other tumors developed in the uterus and were forced to follow directly in the same channel as the one preceding. Single tumors were generally found in the broad ligament and the development of others occurred before we could have the variety we were studying. Many subperitoneal tumors were observed, and few indeed had been seen where the tumor had lost all connection with the uterus. Such growths, he said, could not become parasitic and receive their nutrition from some other source, as did the intraperitoneal wandering or parasitic variety. The author had had no experience with a single wandering tumor behind the peritoneum which had entirely lost its uterine connections, and believed such development an impossibility, for the reason that a *vis à tergo* must exist. The movement of these tumors was therefore directly opposite to that of the intraperitoneal variety, for the latter must have either movable organs to assist in their progress or else traction, a result of

adhesive contact, must aid in the elevation of them upward in the abdominal cavity.

DR. STONE reported two cases illustrating the variety described in his paper. Both of these had grown to very large proportions. In the first, the largest tumor was very high in the abdomen and was entirely separate from all former uterine connection including its blood supply. The presence of a large wedge-shaped middle portion was sufficient proof of the mode of development. It had forced other growths both upwards and downwards, acting as a wedge between the two.

In the second case the central portion of the specimen was made up of many small tumors which had appeared to force the larger growths in opposite directions, as in the first case. The largest growth was highest, and was completely separated from the uterus and the tumors below, except by a small amount of connective tissue, and its anterior peritoneal covering.

The pelvic tumors in both of these cases were firmly impacted. In the second case it was impossible to release the specimen without injury to deep and unseen vessels, which resulted in a fatal hemorrhage. The first patient made a fairly satisfactory recovery, and was now able to attend to her duties as housekeeper.

DR. CHARLES P. NOBLE, of Philadelphia, stated that fibroid tumors could become detached from their original site and wander in the peritoneal cavity and could secure a new blood supply by peritonitis, adhesions, and the formation of vessels. He had been placed a number of times very much in the predicament that the essayist was placed in his second case when there was an ugly hemorrhage deep in the pelvis which could not be reached, and in at least two instances he had been able, by having an assistant make firm pressure on the aorta, to cut off the blood supply of the pelvis, and was able to get rid of the tumor sufficiently to control the bleeding.

DR. HENRY T. BYFORD, of Chicago, had seen cases in which the tumor, much larger than a nine months' fetus, had come away without any trace of pedicle.

DR. GUY LEROY HUNNER, of Baltimore, stated that at times one was greatly assisted in the removal of these tumors by splitting the tumor. This was especially true of those tumors which filled the pelvis.

DR. ROBERT S. HILL, of Montgomery, Ala., in referring to Dr. Stone's fatal case said that it illustrated three points: (1) The absolute impossibility of adhering to any hard and fast rule of procedure. The surgeon must adapt himself to the case. He must enucleate the tumor as the indications present themselves. (2) Whatever may be our attitude regarding the removal of or interference with fibroid tumors in general, he believed when we found a uterine fibroid, located retroperitoneally, it should be enucleated or removed. A small retroperitoneal fibroid could be removed with little or no difficulty;

but if allowed to develop and enlarge, it became a serious proposition. (3) The case illustrated the advantage of catheterization of the ureters; yet it would seem that the very cases in which this procedure was expected to assist us were the ones in which we could not use it.

DR. R. E. FORT, of Nashville, Tenn., reported the case of a woman, 65 years of age, who had never noticed the presence of a tumor until eighteen months ago. A year ago it began to grow, and at the time of its removal it was as large as a good-sized head. On opening the abdomen he found the tumor sprang from the retroperitoneal portion of the uterus, with a pedicle only the thickness of a double fold of peritoneum, and two inches long. In removing the tumor from the pelvis, before he could get a ligature to tie it off, the pedicle was found so friable that it began to tear. However, it was tied off. The woman went into collapse, and it was with great difficulty that reaction set in. The tumor was a myxofibroma.

He detailed another case in which the retroperitoneal tumor sprang from the lower portion of the fundus of the uterus, pushing back the broad ligament. The tumor was about the size of a turkey egg. When the broad ligament was split from its uterine side and laid back and the tumor enucleated, he found the lower portion of the tumor surrounded by the left ureter and the anterior portion of the tumor with the uterine artery quite a third around the tumor.

The subject was further discussed by Drs. Robert T. Morris, Joseph Ransohoff, Charles L. Bonifield, Daniel H. Craig, and the discussion was closed by the author of the paper.

AN OPERATION FOR LARGE RECTOCELE.

DR. GEORGE H. NOBLE, of Atlanta, Ga., described the technique of an operation which he said was intended only for large rectocele. Small rectocele could be relieved by ordinary perineal operations. In large rectocele, however, not infrequently there was more or less tediousness, loss of blood in the denudation, and there was certain objections to puckering the overstretched and distended tissues together and forcing them into the rectum. Furthermore, the unsatisfactory results from infecting the strong and resisting recto-vaginal septum had to be considered. This operation was presented for the purpose of overcoming those objections.

The various steps of the operation were described as follows:

1. Thorough dilatation of the anus and recleansing of the rectum.
2. Denudation of a wide collar, as it were, the ring around the neck of the rectocele, beginning high up in the vagina and extending near to the promontory of the rectocele. It is unnecessary to remove the mucosa over the last point mentioned, as it is cut away in the resection. By proceeding with the denudation from within outward the veins of the recto-vaginal

septum are cut through at a high point and secured with compression forceps, and the necessity of repeatedly cutting the same vessels in the process in repairing the wound is avoided.

3. Two fingers are placed upon the promontory of the rectocele, are carried into the vagina, and out through the anus, forcing the rectocele ahead of them, and in this way completely everting it through the anus. It is seized with a pair of forceps at the point where it protrudes and is gradually drawn down step by step until all lax portions have been secured and a feeling of tenseness is felt.

If, in drawing the anterior rectal wall down, the normal parts of the rectum do not come as low as the levator ani, the rectum should be liberated by dissecting it from the vagina, which will permit of further descent and allow all of the overstretched tissues to project beyond the anus.

4. A light pair of compression forceps is then placed upon the neck of the rectocele, just external to the anus, for the purpose of holding it in position.

5. The sutures, preferably medium-sized kangaroo tendon, are passed through the unruptured portion of the perineum close to the sphincter ani muscle after the manner Emmet inserts his tension sutures in perineorrhaphy. These two sutures in passing across from side to side should take up the prolapsed portion of the anterior wall of the rectum. When tied, they closely approximate and anchor the sound or healthy rectum to the levator ani muscle and rectal vessels in deep pelvic fascia.

6. The vaginal side of the wound is completed by doing a perineorrhaphy.

7. The protruding rectocele is amputated about three-quarters to an inch external to the clamp and its edges closely sutured with continuous suture catgut. The case should be treated then as an ordinary perineorrhaphy, except a wet soft dressing is placed over the protruding stump. The stump retracts within the anus in a week's time and takes care of itself.

STARVATION AND LOCKED BOWELS FOR FROM TEN DAYS TO TWO WEEKS.

DR. HOWARD A. KELLY, of Baltimore, in a paper with this title, mentioned this as a method of after-treatment which he had used in some fifteen cases, for the most part in complete tears in the recto-vaginal septum. The treatment consisted in two parts—first, a very limited diet for from ten to fifteen days, and, second, the locking up of the bowels during this period.

The food is limited to albumin in water, giving nothing the day following operation, and but one dram every three hours on the second day, and increasing this a dram each day until the patient was taking four drams every three hours. In this way the patient was fed in all during a period of ten days not quite three pints of albumin and absolutely no other food.

One patient was continued for fifteen days on this diet and without an evacuation. At least two very frail patients were treated in this way. When the evacuation did take place, two drams of licorice powder were given, and in some cases an oil enema, and the passage was secured with the patient lying on her side so as to avoid any straining. In no case were there any scybala, nor was there any difficulty with the evacuations.

The author thought this starvation plan of treatment might have a wider range of utility in treating dyspeptics and hysterical patients, as well as in all kinds of plastic operations on the intestinal tract.

DR. O. H. ELBRECHT, of St. Louis, Mo., detailed a case in which he thought it wise to lock up the patient's bowels for eighteen days. She had had two unsuccessful perineorrhaphies performed on her, and there was a great deal of scar tissue at the site of the former operations, rendering dissection difficult. The only indication for locking the bowels up so long in this case was the previous unsuccessful perineorrhaphies. He did not think one was justified in locking up the bowel so long in ordinary perineorrhaphies.

DR. CHARLES L. BONIFIELD, of Cincinnati, said he had never carried the starvation diet to the extreme advocated by the essayist. It was his rule to move a patient's bowels after perineorrhaphy, etc., on the fourth or fifth day, restricting the diet up to that time. The best means he had found for securing liquid movements of the bowels was to give an injection of oil to begin with, or begin with calomel. He thought calomel, when given, had more to do with dissolving scybalous masses than any salts or anything of that sort one could give. If a patient took one-quarter of a grain of calomel every half hour for six hours, or small doses of salts, it would give rise to fluid movements of the bowels, more especially if oil was injected half an hour before one expected the bowels to move.

DR. GEORGE H. NOBLE, of Atlanta, Ga., said it was his practice to stop the bowels in cases of complete lacerations for five or six days, and in cases of incomplete lacerations for four days, acting upon the principle that in that time, if there was no infection, union would be sufficiently strong to permit the evacuation of the bowels by the aid of an enema. Of course, patients were confined to a fluid diet, albumen mainly, buttermilk, and certain liquid peptonoids, excluding sweet milk. If there was any difficulty in evacuating the bowels, the enema was repeated.

DR. HENRY T. BYFORD, of Chicago, said that he had kept some patients on several ounces of albumen a day when he thought it was good for them to lose flesh, but there was objection to prescribing such a restricted diet as that mentioned by the essayist for such a long time unless it was necessary.

DR. CHARLES P. NOBLE, of Philadelphia, said that some years ago he did the ninth operation on a woman. She had already had the eighth sphincter operation, and as a result of the eight

operations there was a great deal of scar tissue present. The eight operations were done by other surgeons. In that case he adopted the conservative plan of locking up the bowels for twelve days. The patient received coffee, alcohol, peptones, etc., but egg albumen was the principal part of her diet. Milk was avoided. He obtained a good result in this case; in fact, he was so pleased with the result after eight failures, that he tried the lock-up starvation plan systematically for a while, but his fourth or fifth patient so nearly died from the method that he abandoned it. This patient got an acute autointoxication and almost died from prostration. It was now his practice to have the patient's bowels move on the third day after operation, and every two days for a week, then every day, and the best results he could claim for this method were nineteen cures out of twenty cases.

DR. GUY LEROY HUNNER said that Dr. Kelly's associates at the Johns Hopkins Hospital ordinarily followed the usual plan of moving the bowels of patients on the third or fourth day after these operations.

DR. J. WESLEY LONG, of Greensboro, N. C., read a paper on

COMMON DUCT OBSTRUCTION.

The author quoted the as yet unpublished statistics of the Mayo clinic, where, he said, there had been more gallstone operations done than in any other clinic in the world, showing that in simple gallstones in the gall-bladder the mortality of operation was less than one-half of one per cent., while the mortality in operations for common duct obstruction ranged from 11.9 per cent. in benign cases to 40 per cent. in malignant cases. These facts were brought out to emphasize the prophylactic value of operating while the stones were yet in the bladder.

With reference to the etiology of common duct obstruction, he took the position that practically all cases were due either to the stones or to malignant growths which themselves were caused by the irritating presence of the stones. Gallstones might exist in the gall-bladder for a long time without causing symptoms, but once in the common duct, not only did they cause pronounced symptoms, but many serious complications arose. The mortality in these cases was due to the complications—the cholemia, infection, inflammation, and exhaustion due to hemorrhage at the operation.

He emphasized the fact that common duct obstruction could be treated only surgically. After the removal of the obstruction, the first consideration was drainage, since it was imperative to overcome the infection; and, second, that no operation must be deemed finished until the patency of the opening into the duodenum was assured.

The author called attention to the importance of not removing the gall-bladder in the operation of choledochotomy,

since stones occasionally would reform in the common duct and in these cases the gall-bladder served for drainage.

DR. LONG reported a number of cases upon which he had operated for common duct obstruction. These cases showed the profound disturbance caused by the stones and the great relief afforded by their removal. In one case in particular it was noted that the stones had ulcerated through the side of the gall-bladder and into the common duct—an exceedingly rare occurrence.

DR. L. H. DUNNING, of Indianapolis, Ind., followed with a paper on

GALLSTONES IN THE CYSTIC DUCT.

He described a procedure which he employed in one case and the history of which he gave in detail. He thought this procedure was a very feasible one. The gallstone was lodged in the cystic duct in front of a small stricture. After making all the efforts he deemed prudent to press the stone backwards into the gall-bladder without success, he then unsuccessfully attempted to dilate the stricture with the finger-tip and later with forceps. One of his assistants suggested that they could better dilate with the forceps if they could see the stricture. The walls of the gall-bladder were elastic. The liver had been turned upwards so that the gall-bladder was near the surface. The opening in the gall-bladder through which they had been working was enlarged a little and then the stone was steadied and held against the stricture by an assistant. The fundus of the gall-bladder was pushed forward toward the strictured entrance into the cystic duct. They so far succeeded as to bring the opening in the wall of the gall-bladder directly opposite to the strictured opening. They then tried to introduce the forceps tips, but failed. Picking up a pair of probe-pointed scissors curved on the flap, the point was gently worked through the fistula and the scissors opened. This did not dilate the opening sufficiently, so the edge of the fistulous ring was snipped slightly in two or three places, when they were able to dilate the fistula so as to permit the easy exit of the stone.

The operation was completed in the usual way. A rubber tube was fastened in the gall-bladder and that viscus anchored to the fascia. Before they had finished the operation it was apparent that a little bile had flowed into the gall-bladder. Two or three ounces of bile were discharged from the tube daily. At first it was dark and thick, but gradually approached the normal color and consistency. The patient made an uneventful recovery, and has had but little further pain or soreness in the gall-bladder region.

In the writer's experience, in operating upon ninety-three cases of gallstones, there were ten cases of stone in the cystic duct which required considerable effort to dislodge them. In two of the cases early in this experience the stones were crushed

and portions left behind, subsequently giving so much trouble that cholecystectomy was finally performed.

GANGRENE OF THE GALL-BLADDER.

DR. JOSEPH RANSOHOFF, of Cincinnati, Ohio, described an interesting case of gangrene of the gall-bladder. He also reported an interesting and instructive case of rupture of the common duct, and in connection with its recital called attention to a sign to which he believed no one had heretofore referred. It was a localized jaundice of the umbilicus.

OVERLAPPING THE APONEUROSSES IN THE CLOSURE OF WOUNDS OF THE ABDOMINAL WALL.

DR. CHARLES P. NOBLE, of Philadelphia, in a paper with this title recommended the overlapping of the aponeuroses in the closure of all wounds of the abdominal wall, including the Alexander operation, inguinal and umbilical herniæ, diastasis of the recti muscles, appendicectomy and nephrorrhaphy. In but a single case did he know of a post-operative hernia where the abdominal wound had been closed by this method. When drainage was employed through the abdominal wound, the method was not applicable.

DR. GUY LEROY HUNNER, of Baltimore, read a paper on

THE DIAGNOSIS OF RENAL CALCULUS.

The author took up the subject from its general relationships, first considering the various other maladies of the kidney from which nephrolithiasis must be differentiated, and then discussing the diseases of other organs which might mislead the diagnostician. The Roentgen ray and the wax-tipped bougie were considered invaluable aids in the diagnosis of renal calculus, but they failed at times, and the importance of the urine examination in all suspected kidney cases was emphasized. Several cases were reported to illustrate the difficulties of diagnosis.

DR. J. WESLEY BOVÉE, of Washington, D. C., read a paper entitled

EXPERIENCE WITH DOWNES' ELECTROTHERMIC ANGIOTRIBE IN PELVIC AND ABDOMINAL SURGERY.

The author had employed these angiotribes in 203 abdominal and 27 vaginal operations. These 230 operations had been hysterectomies and panhysterectomies, and the removal of the appendages by the vaginal route, removal of the same structures by the abdominal route, removal of the vermiform appendix, the spleen, the kidney, of parovarian cyst, of portions of the intestines, etc.

In these 230 cases he had had two of hemorrhage, subse-

quent to operation. He could not believe the method of hemostasis employed was responsible in either instance.

In no other instance had hemorrhage occurred, and he had the most perfect faith in the hemostatic properties of the instrument.

The advantages of the electrothermic angiotribe of Downes in pelvic and abdominal surgery seemed to be a more reliable hemostasis than by ligation; freedom from hemorrhage during operation; the ease of its application in locations in which the use of ligatures would be very difficult and uncertain; the greater security against dissemination in radical operations for malignant disease; the ability to sterilize unclean areas before suturing, as in intestinal and appendiceal surgery; lessening of the tendency to the formation of post-operative adhesions; the increased speed in operations, such as removal of the uterus, the appendages, or the vermiform appendix, and the greatly lessened amount of pain following operation.

The disadvantages were the danger of accidental injury of the bladder, rectum and ureter; the necessity of great precision in its employment, and the special care necessary to keep the paraphernalia in good working condition.

DR. DANIEL H. CRAIG, of Boston, read a paper entitled

CHRONIC ENDOCERVICITIS: A NEW METHOD OF TREATMENT WITH NEW INSTRUMENTS.

The article offered nothing new in the departments of etiology, pathology or symptomatology, but after showing the justifiability of treating chronic endocervicitis as an entity proceeded to outline original ideas in reference to diagnosis, prognosis and treatment.

The diagnosis was made to depend upon the condition of contraction or relaxation of the internal os. If with an ordinary Simpson or Sims uterine sound distinct resistance was encountered at the internal os, in the absence of flexions, the inflammation was confined to the tissues external to the internal os; if, on the other hand, the internal os was distinguished with difficulty or not at all because of its relaxation and wide caliber, the inflammation was above the internal os, which was thus widely dilated to favor free drainage and to guard against back-pressure. Treatment by Craig's method should be strictly confined to those cases in which the internal os was distinctly contracted.

Craig's treatment, or operation, consisted in curetting the cervical canal up to but not beyond the internal os with a specially designed curette after dilatation of the external os with a conical dilator, also specially designed for this purpose. The operation was quickly and easily performed at the gynecologist's office without the use of anesthesia, except occasionally a few crystals of cocaine at the external os, and without confinement

to bed. The pain when done without cocaine was about the same as that due to the filling of teeth.

Inasmuch as the most rigid asepsis was requisite to render such ambulatory treatment safe, the author did not offer this little operation for the use of those not thoroughly familiar with surgical and gynecological manipulations, but for those who were able to establish and *maintain* a rigid asepsis.

The preparatory and after-treatment consisted of three 1-5,000 formalin douches daily for three days before and for ten days after the operation, with avoidance of unusual exertion and abstinence from sexual relations.

The cure was prompt and complete, only a relatively few very severe cases having required more than the original curettement.

Tuboovariitis or other concomitant disease which might be aggravated or lead to a recurrence constituted a contraindication to Craig's treatment, except as an immediate preliminary to radical operation.

The treatment was not intended as a substitute for tracheloplasty nor for uterine curettement in cases in which the disease had invaded the corporeal endometrium. The use of this method should not be attempted until the original paper had been read in detail.

DR. F. W. McRAE, of Atlanta, Ga., read a paper entitled

THE SURGICAL TREATMENT OF FLOATING KIDNEY; POSTOPERATIVE RESULTS.

The author argued for surgical intervention rather than attempted support by bandages or forceps, but he urged careful selection of cases for operation and the recognition and correction of associated pathological conditions.

Special attention was directed to the frequent coincidence of floating kidney and chronic or recurring appendicitis.

The author reported twenty-two cases in which he had employed this operation.

DR. RUFUS B. HALL, of Cincinnati, Ohio, read a paper entitled

TRAUMATISM OF THE URETER AND PELVIS OF THE KIDNEY.

The author said that traumatic injury to the pelvis of the kidney or ureter causing post-peritoneal extravasation of urine was sufficiently rare to warrant reporting such cases. He had been fortunate enough to see two such cases.

The first case was Miss L., aged 9 years, daughter of a dentist, who was admitted to the hospital December 9, 1898, with the following history: The child was strong, vigorous and well-developed for her age, and had always enjoyed excellent health before the present illness. Six days before her admission, while on her way to school, she was passing along a railroad track,

and as she approached a trestle across a ravine, the track at the end of the trestle was elevated on filled ground ten or twelve feet high. The child was running and started to go down the side of the hill and fell headlong, striking hard on her abdomen. She helped herself up and walked a quarter of a mile or more to school, but complained of a pain in the abdomen. She was able to walk home half a mile or more which she did soon after reaching the school house, on the advice of her teacher. The child complained of a great deal of pain and was restless the entire afternoon and night. The next morning the family physician was called to see her. He did not observe any swelling in the abdomen, but the whole abdomen was tender to touch and he feared that the child would develop peritonitis. In the afternoon of that day the pain was localized in the right side, and especially to the back over the region of the kidney, and there was some swelling in that region. The child grew gradually worse from this time on; the swelling increased gradually until the time of her admission to the hospital, when the enlargement was larger than the child's head. The swelling extended from the ribs down to the pubic bone and was confined to the patient's right half of the abdomen. The patient was unable to stand or walk and was unable to straighten out the right leg. She suffered great pain. The respiration was rapid, and the pulse rapid and feeble. The child was pale, but there was no rise of temperature. Her condition was so desperate that an immediate consultation was called. Dr. E. W. Walker saw her with the essayist and it was agreed to aspirate at once for temporary relief, which was done, and six pints of straw-colored fluid, resembling urine, was withdrawn and the tumor disappeared. The fluid proved to be urine. The sac rapidly filled up and in four days it was as large as before, or even larger, at which time the child was given an anesthetic and an incision was made over the loin just as one would make in extirpation of the kidney. This was made with the object of establishing free drainage or a more radical operation if that was found necessary. After cutting down through the muscles and the fat, a large accumulation of urine was found post-peritoneally. The kidney was in the normal position and was normal in appearance. The operation was completed by placing a drainage tube for free drainage, so the child might recover from her serious illness, and then later do what surgery might be necessary for her relief. Just what injury to the pelvis of the kidney or ureter had been sustained, they could not determine at the time of operation. The child's condition improved very rapidly. The greater part, if not all the urine from that kidney came through the drainage tube during her stay in the hospital. She left the hospital convalescent on December 24, eleven days after the operation with the sinus still discharging urine freely, and her general health improving. Urine continued to discharge through the drainage tube until January

10, when it closed permanently and had remained so since. She was a very strong and vigorous young woman, now 16 years of age.

In reviewing the history of this case, the author was inclined to believe that there was a free rent either in the pelvis of the kidney or in the ureter. Within a comparatively short time, forty-eight hours, there was such an extravasation of urine that there was a well-developed tumor as large as a cocoanut in the region of the kidney. This enlargement would naturally displace the ureter and peritoneum, obstructing mechanically the passage of urine through the ureter. The kidney must continue to secrete urine and this added to the size of the extravasation until her condition became desperate. After evacuating with the aspirator, the urine readily accumulated so that at the end of forty-eight hours there was a tumor as large as a quart cup, while from the bladder the patient passed but little more than that amount of urine, showing that but little, if any, urine passed from the affected side into the bladder. After a drainage tube was placed and the urine collected from the injured side there was about as much urine discharged from this side as from the bladder, and this continued to remain so for more than ten days, after which time the urine began to pass through the ureter, at times into the bladder. By placing a drainage tube and allowing the urine to escape so that the ureter would not be displaced, thus giving nature an opportunity to repair the injury, which it did, the urine passed the normal way to the bladder, and the patient rapidly recovered.

DR. HALL reported a second case in a male, aged 17 years.

DR. E. E. BALLOCH, of Washington, D. C., contributed a paper entitled

BND RESULTS IN APPENDICITIS WORK.

He stated that it was his practice to remove the appendix in the course of every abdominal operation, where the interests of the patient would not be prejudiced by such a procedure. In endeavoring to justify this practice it had occurred to him to try and find out from the patients themselves the results of the removal of the appendix. For manifest reasons cases of acute appendicitis were not considered, nor was it considered fair to try to include those cases where the appendix had been removed in the course of other abdominal work. There remained the cases of chronic and quiescent disease, and accordingly the following questions were asked of twenty-five private patients upon whom operation had been done for disease of the character indicated.

1. What is the condition of your general health now, as compared to what it was before your operation?

2. With respect to pain in the abdomen, digestive disturbances, bowel movements, etc., is your condition better or worse before operation?

3. Has your body weight increased or diminished?

4. Are there any other results, good or bad, which you consider to be due to the operation?

Twenty-three replies were received and the answers were almost uniformly to the effect that health, strength and weight were better than before operation. The analogy between these cases and those in which the appendix was removed in the course of other abdominal work, lay in the fact that one could not tell from the appearance and feel of the appendix whether or not it was normal, and by leaving appendices which looked sound one was liable to leave appendices which would give trouble later.

Two instances were given where death resulted from appendicitis, in one instance six, and in the other eleven, years after abdominal operations for other conditions.

The argument that the appendix was an organ necessary to health was examined and the conclusion reached that the facts of comparative anatomy and pathology were against such a theory. The following conclusions were reached:

"1. The appendix is a rudimentary organ, a part of the cecum, undergoing obliteration, and so far has not been shown to be in any way a necessary part of the human economy.

"2. Reasoning from the results of operation in cases of chronic and quiescent appendicitis, the removal of the appendix in the course of operations for other conditions is justifiable.

"3. The difficulty of determining from macroscopic examination whether an appendix is healthy or not is an argument in favor of the removal of the organ.

"4. The fact that deaths have occurred which could have been avoided had the appendix been removed at the first operation is a powerful argument in favor of the removal of the organ, whenever opportunity offers, provided always that the additional operation will not jeopardize the chances of the patient for recovery."

TWO CASES OF VAGINAL CESAREAN SECTION FOR ECLAMPSIA WITH RECOVERY.

DR. JOHN F. MORAN, of Washington, D. C., read a paper on this subject in which he stated that, owing to the obscurity of the etiology and the indefinite state of the pathology the treatment of eclampsia was necessarily, to a considerable extent, empirical. Accepting the theory of toxemia, however, elimination, sedation and safe delivery, were the methods of procedure to be considered.

As to the first and second indications, there was general accord, differing only in the matter of detail. As to the third, however, there was a decided lack of unanimity.

He preferred the combined treatment, and believed that delivery should be effected as speedily as possible, consistent with

safety, in the interests of both mother and child. Essential to success was a well-thought-out plan of prompt, definite, but not over-zealous treatment, based on the various phases of the disease, combined with a knowledge of the condition of the cervix and the changes it must undergo before labor can terminate or be terminated.

In primiparæ, during labor, there was dilatation from above downwards with gradual effacement. In multiparæ, on the other hand, until the onset of labor, the internal os was usually closed, but the external os was patulous. As labor progressed, the entire canal dilated and there might be little or no effacement, particularly if the dilatation occurred before the presenting part had entered the brim. These characteristic differences should be borne in mind as they had an important bearing upon the method of procedure. If the cervix was well dilated, forceps or version should be employed, depending upon the location of the head. When the cervix was undilated the rubber bags might be used with good effect, provided time was not a necessary element, as in impending eclampsia, but on account of the slowness and uncertainty of action they could not be relied upon during convulsion. Manual or instrumental methods were serviceable when the cervix was effaced or effacing, but when it was intact, they were not applicable except in skilled hands, and even then there was great danger of extensive lacerations of the cervix and lower segment of the uterus, with possible hemorrhage and subsequent infection. It was in this class of cases that multiple incisions of the cervix, vaginal Cesarean section and the classical Cesarean section had been advocated.

The statistics of classical Cesarean section in thirty-nine cases reported by Hillman gave a maternal mortality of 51.3 per cent., and fetal 43.9 per cent., and were not more favorable than other methods of intervention; therefore, in the absence of the absolute indication, contracted pelvis, it was not to be recommended. Multiple incisions were of value when the cervix was effaced. When it was not, they were fraught with danger because of the likelihood of hemorrhage and extension of the incision by tearing during extraction on account of insufficient dilatation. It was here that the operation of vaginal Cesarean section as performed by Acconi (1895) and Duhrssen (1896) was more advantageous because it provided ample opening of the cervix to admit of immediate extraction.

The author reported two cases and described the technique.

CESAREAN SECTION NECESSITATED BY OBSTRUCTION OF PELVIS BY RIGHT HALF OF BICORNUATE UTERUS.

DR. GEORGE S. BROWN, of Birmingham, Ala., reported the case of a woman of 30 at term, with her fourth pregnancy, who was sent to him for treatment under the supposition that

she had placenta previa. The pelvis was full of a soft, boggy mass supposed to be a myoma of the lower uterine segment. There being no possibility of the head engaging, section was done while the mother and child were still in perfect condition. A full term healthy boy was taken from the left half of a bicornuate uterus after the Saenger method. The right half was then opened and the excessive sympathetic decidua scooped out. This half was as large as a four-month pregnancy. One or both halves should have been removed, but this was not done because it was thought the patient was in danger from the ether anesthesia. Her pulse was rapid and intermittent, and her color and respiration were alarming for a time, but within two hours after being returned to bed she was seemingly as well as after a normal labor. She had an infarct or ether pneumonia two weeks after the operation, which passed off in a few days. The child has been perfectly healthy since its birth.

OFFICERS.

The following officers were elected for the ensuing year: *President*, Dr. George H. Noble, Atlanta, Ga.; *Vice-Presidents*, Drs. Stuart McGuire, Richmond, Va., and E. Denegre Martin, New Orleans, La.; *Secretary*, Dr. W. D. Haggard, Nashville, Tenn. (reelected); *Treasurer*, Dr. Chas. M. Rosser, Dallas, Tex. (reelected).

Baltimore, Md., was selected as the place for holding the next annual meeting.

TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF LONDON.

Wednesday, November 1, 1905.

A. C. BUTLER-SMYTHE, F.R.C.S., EDIN., *Vice-President, in the Chair.*

SUBTOTAL HYSTERECTOMY: AFTER-HISTORIES OF SIXTY CASES. BY ALBAN DORAN, F.R.C.S.

THESE sixty after-histories of cases where the author performed subtotal hysterectomy for fibroid diseases on women who had not reached the menopause are here tabulated and analyzed in order to determine how far that operation is liable to be followed by disagreeable consequences. In every instance a reliable after-history, extending to at least two years after operation, could be obtained, cases with short or otherwise imperfect histories being rejected. As regards the removal of the tumor the results of subtotal hysterectomy appear uniformly beneficial, but certain discomforts, more or less associated with artificial menopause, sometimes follow the operation, and these

records may be of service in indicating how far these discomforts may be avoided.

The preservation of one or both ovaries is never justifiable when, as is not rare, cystic or inflammatory disease is present, but when healthy at least one ovary should be saved. Abel and Zweifel maintain that it is essential to preserve a portion of the endometrium as well, in other words, to amputate the uterus above the level of the os internum, in order to ensure the patient against the discomforts of an abrupt menopause.

In twenty-eight cases both ovaries were removed. In three the menopause was neither immediate nor complete, and in at least two the blood must have proceeded from endometrium. In six the menopause was complete without symptoms; all the six patients were over thirty-eight years of age. In nine the menopause was distinct, complete and mild, whilst in ten it was complete with severe symptoms. In the worst case the patient was a woman aged 38, of doubtful sanity and intemperate habits. For three years her health remained good, but she was troubled with flushings; then she resumed her bad habits, and, at the end of six months, died after drinking carbolic acid. In another case where the patient had been insane before the operation the mental symptoms recurred a few months later, but soon subsided.

In twenty-six cases one ovary was saved. In eight the catamenia were regular for a longer or shorter period after operation. In five the catamenia appeared after operation, but irregularly. In thirteen the menopause was complete and immediate after operation, without symptoms in four patients, whilst in none of the remaining nine were the symptoms severe, as in the similar sub-series, where both ovaries were sacrificed.

In six cases both ovaries were saved. In three the catamenia continued regular after operation, in two they reappeared but were soon suppressed, and in one the menopause was complete and immediate after operation, without symptoms.

The Abel-Zweifel theory seems to receive support from these statistics. Thus, in seven out of the eight cases where one ovary was saved and the catamenia continued regular, and in two out of the three where both ovaries were saved and the catamenia continued regular, the author had purposely amputated the fibroid uterus above the level of the os internum. In many cases where some endometrium was spared in this manner the period became irregular or never reappeared, but, in these instances, the portion left behind might have been diseased or damaged during the operation, or destroyed in the course of cicatrization of the stump of the uterus. Flaps of uterine wall without endometrium are, according to these statistics, insufficient as guarantees against severe menopause symptoms.

The author considers that a similar analysis of sixty cases of panhysterectomy for fibroid where, of necessity, no trace of endometrium can be preserved would be instructive.

MR. BUTLER-SMYTHE congratulated Mr. Doran on the excellent work done in tracing the after-histories of his cases and hoped that other operators would follow his example.

MRS. BOYD suggested that in appraising the effect of operation in the production of menopausal symptoms, it was important to bear in mind how varying were the symptoms accompanying the natural menopause in different individuals. In twenty-two cases of supravaginal amputation with retention of one or both ovaries operated on up to the spring of 1904 she had investigated the after-results. In all but three the results were excellent and in some cases striking as to the general health and the three exceptions were in poor health before operation. In none were there really severe menopausal symptoms and in only one did a periodic sanguineous discharge persist. In that one she was not aware that she had left any endometrium, but she had noted that an inch and a half of cervix remained. In all the other cases amputation was at or below the internal os.

DR. HERBERT SPENCER said he considered that the title "sub-total" hysterectomy was an objectionable expression and moreover was inapplicable to an operation in which the whole of the cervix and part of the body were left behind. Personally, he had always endeavored to leave one or both ovaries in every case of hysterectomy for fibroids. Dr. Spencer thought it was proved beyond question that the retention of the ovaries was of value to the patient and was not followed immediately by flushings, whereas flushings usually occurred when the ovaries were removed. Zweifel's views had recently been disproved. He was sorry that he could not at present give the after-histories of his cases for comparison with the after-histories given in Mr. Doran's paper; but as he had in every case endeavored to leave one or both ovaries behind he had no doubt that they would compare favorably with regard to the occurrence of flushings with Mr. Doran's cases in nearly half of which both ovaries had been removed. One case, however, was sufficient to disprove the statement that it was essential to preserve a portion of the endometrium. He had two days ago seen a case in which he had performed total abdominal hysterectomy seven years previously for cancer and fibroids in a woman of 36, one ovary being left behind. The patient had no flushings nor other symptoms of the menopause for six years after the operation, and then the symptoms were slight. He remained of the opinion that total hysterectomy was greatly superior to the partial operation. The mortality had recently been shown to be less than that of the partial operation. Dr. Heywood Smith remarked that in most of the vertebrata the organs for the elimination of the sperm and germ cells respectively were duplicated, but it was not known whether this was merely to guard against disease or accident or for some other purpose. Further investigation into the natural history of menstruation

was required in order to judge the effect of the removal of one or both ovaries.

DR. W. S. A. GRIFFITH altogether disagreed with Mr. Doran in his statement that the preservation of the ovaries in the operation of hysterectomy "is never justifiable when cystic or inflammatory disease is present," a statement which Mr. Doran would certainly not have made had he been writing from the point of view of the diseases of the ovary.

MR. MALCOLM thought that further evidence as to the variation in the severity of the menopause in women generally is desirable. The worst cases of climacteric symptoms which he had met with occurred, one in a girl of 23, from whom two dermoids, very adherent from twisting of one pedicle, had been removed; the other in a woman of 54, from whom a very hard calcareous uterine tumor was taken four years after the periods ceased. The effects of removal of both ovaries were extremely variable. He was not persuaded by the evidence brought forward by Mr. Doran to alter his practice of removing the uterus completely.

MR. DORAN replied.

DIMINISHED ALKALINITY OF THE BLOOD IN ECLAMPSIA.

DR. C. NEPEAN LONGRIDGE read a short communication on a case of eclampsia. The patient had a stillborn infant and eclampsia during the first labor. During pregnancy she was seen at frequent intervals and no symptoms of renal inadequacy or toxæmia were found. On the day of admission to Queen Charlott's Hospital she suffered from headache, vomiting and diarrhoea, the onset of the symptoms being sudden. Fits began immediately on admission. The blood pressure was 160 mm. of mercury by the Riva Rocci instrument. Obstetric treatment was expectant, natural dilatation of the os being completed eight hours after admission; the membranes were ruptured and a full-time infant delivered with forceps. Seven fits occurred before, and one during, delivery. Morphia and purgatives were given. Ten fits increasing in severity occurred in the next ten hours, the last three being slight. Jaundice lasting for five days, with labial herpes and itching, was noticed on the third day. The urine was free from albumin on the sixth day and the blood pressure was 120 mm. of mercury on the third day. Dr. Longridge drew attention to two novel points in treatment. Citrates were given with the object of bringing up the diminished alkalinity of the blood to normal. Sugar was given by the mouth and rectum in order to replace the glycogen in the liver, without which it cannot exert its antitoxic function.

DR. HANDFIELD-JONES quoted two cases in which the patients had had convulsive seizures in several consecutive confinements, and in whom the kidney function had been most regularly performed in the intervals. He was much interested in Dr. Longridge's observations.

DR. EDEN regarded the observation of Dr. Longridge as to the marked diminution in the alkalinity of the blood to be of great practical importance, for if it should prove to be a constant occurrence in eclampsia then a definite advance was assured in our knowledge of the nature of the toxemia, and by using a definitely alkaline solution for transfusion an immediate effect might be confidently anticipated.

SPECIMENS.

DR. WALTER TATE showed a fibromyoma of the uterus, associated with a large cavity containing retained menses and communicating with the uterine canal, which had been removed from a woman of 49. He thought that the cavity had been produced by a gradual expansion of the anterior wall of the uterus at the junction of the body and cervix and possibly without any actual obstruction. Dr. Handfield-Jones suggested that the fibroid, by bulging into the uterine cavity, might have acted as an impediment to the outflow of the menstrual fluid.

DR. WALTER TATE showed a degenerating fibromyoma and sarcoma in a uterus removed by operation from a single woman, 35 years of age. He raised the question as to whether the sarcoma was due to the malignant change in a pre-existing fibroid or whether it was a primary growth.

DR. HANDFIELD-JONES showed a polypoid growth, which proved to be a pure myoma, which he had removed from the left labium majus of a young woman aged 38.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

The Placental Ferments.—Peter Bergell and W. Liepmann (*Munch. med. Woch.*, Nov. 14, 1905) give the results of their experiments as to the existence and the nature of the placental ferments, reached by examination of the fresh organ. They found a diastatic ferment present in appreciable quantities, which converted starches. There was no saccharifying ferment. There was a weak ferment similar to lactase, but lacking in its powerful reaction. There was also found a glycolytic ferment. Of ferments that break up proteids they found one similar in action to trypsin, in considerable quantities; no fat-splitting ferment was present. Temperature does not affect the solubility of the ferments, and they seem to be partially intracellular. The authors conclude that there are in the placenta strong fermentative principles, which play a synthetic part in the physiology of the fetus.

Scopolamine in Obstetrics.—Albert Laurendeau (*La Presse Méd.*, Nov. 18, 1905) tells of his use of scopolamine in

symphyseotomy and in cases of normal labor to relieve the pain of delivery. Whenever the labor is unusually painful he uses scopolamine by hypodermic injection, employing the hydrobromate in doses of 1-50th grain with 1-5th grain of morphine. The dose is repeated after six hours if necessary. The patient sleeps most of the time and awakes in good spirits, after a sleep of 12 to 18 hours. The period of expulsion may be somewhat retarded, but is without pain; the anesthetic seems to favor uterine dilatation. The infant seems to be sleepy and it requires slapping to cause good respirations, that serving better to arouse it than artificial respiration. The pupil is dilated in the infant. In the adult the respiration is always slow and deep, and the pulse is quickened. If there is any danger it is to the respiration end and not the circulation.

Technique of Pubiotomy.—Walter Pfeilstickler (*Zent. f. Gyn.*, Dec. 2, 1905) advocates the use of Walcher's altogether subcutaneous pubiotomy, the principal difference between which and the ordinary procedures is that the needle is passed from below upward, instead of from above downward. No operation in which the finger is introduced into the wound of entrance as a guide can be regarded as subcutaneous. In Walcher's operation there is made with the knife simply a puncture of sufficient size to allow of the entrance of the dull-pointed needle the puncture being in the labium majus. The needle is then passed close to the bone, internally to the crus of the clitoris, thus avoiding wounding this structure and the consequent hemorrhage. It is impossible to pass it from above downward close to the bone and internal to the crus of the clitoris. There are left only two insignificant wounds that may be sealed with iodoform and cotton, and a simple Esmarch's bandage is placed about the hips. Even if the needle passes beneath the peritoneum no harm is done.

Mechanism of Labor.—Leonardo Gigli (*L'Obstétrique*, Nov., 1905) believes that we have not a clear conception of the true mechanism of labor because we are not able to picture the various stages in our minds. This is due to the arbitrary division of the act into engagement, descent, rotation internally, disengagement, external rotation and expulsion. The mechanism of labor is a complex movement, vital, and passive, which the fetus is forced to make in the different segments of the pelvis by reason of the expulsive force of the uterus. The author would add to the divisions of the act "projection forward." Thus we should have descent, projection forward, internal rotation, disengagement, external rotation, expulsion. This movement of projection forward has long escaped the observation of clinicians; in many cases it is reduced to a simple increase of pressure on one point of the anterior wall of the pelvic basin. The movement of rotation in the occipito-posterior position does not take place unless the muscular diaphragm of the pelvis is intact; when the muscles have lost their tonicity it is not complete. The addition to the stages of labor of

"projection forward" before disengagement and external rotation makes all clear.

Puerperal Self-Infection.—Harold Natvig (*Zent. f. Gyn.*, Dec. 2, 1905) believes that there may be a spontaneous self-infection of the woman with streptococci from her own vagina, which have remained harmless, in a saprophytic stage of existence, and at the time of labor have developed a virulence that results in puerperal septicemia, the germs migrating from the vulva to the uterus during the latter part of labor, or in the first days of the puerperium. The author has never seen a spontaneous infection by streptococci that have been living in the vaginal secretion before labor. In only one normal case did he observe in the vaginal secretion, before the rupture of the membranes, bacteria similar to the streptococcus, which he characterizes as parapneumococci. They were very slightly virulent, produced no fever, and quickly disappeared from the vaginal secretion. Rumm takes the ground that the danger is from without, on the ground that usually no virulent bacteria are found in the vaginal secretion. The author found virulent streptococci in three out of five cases before the rupture of the membranes. The author concludes that a streptococcus, living in the vulva before labor in a saprophytic state, may ascend into the uterus and produce a puerperal infection.

Experiments with Reference to the Pathogenesis of Eclampsia.—Oscar Semb (*Archiv. für Gyn.*, Bd. 77, H. 1) details the experiments made by him on dogs, eliminating the toxic effect of normal human serum by gradually establishing an immunity to it through small amounts injected, and then injecting serum of eclamptic cases into the immunized animals. Ten animals were injected: 5 died, 1 had a severe reaction from the eclamptic serum, 3 had slight reaction, 1 showed no reaction. The principle symptoms of the reaction were dyspnea, frequent pulse, albuminuria and hematuria with weakness. None of these symptoms are characteristic of eclampsia. The anatomopathological changes are characteristic of eclampsia both in the liver and the kidneys, and correspond with the appearances after death from eclampsia in man. He urges further experiments in this line, as the number of animals successfully immunized and injected by him was so small.

Eclampsia.—John W. Byers (*Lancet*, Sept. 9) recommends that the following methods of treatment be employed if the attacks cannot be warded off. Treat the convulsion with morphine subcutaneously. Keep the patient on her side, purge freely, use saline injections, allow no liquids; in a word, take care of the convulsions, and let the uterus take care of itself.

If labor has not set in treat the convulsions, but do not induce premature action of the uterus. If labor has begun and the patient is in the second stage, and the os dilated, give chloroform and deliver by forceps if possible, or by turning. If,

however, morphine and purgation with saline injections have been tried and the patient is not improving dilate the cervix and deliver. For convulsions after delivery use morphine, purgation and saline injections.

GYNECOLOGY AND ABDOMINAL SURGERY.

Histogenesis of Simple Cysts of the Ovaries.—Domenico Cesa-Bianchi (*Arch. per le Scienze Med.*, Vol. XXIX, No. 1) after going briefly over the theories of the formation of simple cysts of the ovaries brought forward by different observers, sums them up as follows: The different hypotheses resolve themselves into two; most authors believe that cysts result from hydrops of the follicles which have failed to rupture; others derive these cysts from introfolding of the germinative epithelium similar to the formation of cystomata of the ovaries. The author then goes on to describe the examination of many normal ovaries of different animals made by him, including those of guinea-pigs, rabbits, cats, dogs, etc. In all these animals small simple cysts were found in normal ovaries, resulting from embryonal remains of the Wolffian bodies. They are most frequent in the medullary portion of the organ, and vary much in size. They may be bilocular and even multilocular, and may exert pressure on the other tissues of the organ so as to cause their atrophy. He does not believe that these cysts result from hydrops of the follicles, but that they are the result of embryonal remains of the Wolffian bodies, normally existing in the mammals, which, undergoing congestion and prolonged hyperemia, have become abnormally developed and formed cysts. The author also sought by various injuries to the ovary and by grafts of various tissues to cause cyst formation. He believes that aseptic inflammations have no part in producing cysts.

Ovarian Transplantation.—G. L. Basso (*Arch. für Gym.*, Bd. 77, H. 1) sums up the experiments of various authors as to the possibility of transplanting the ovaries in animals and in man. In autoplasmic cases, according to some observers, the transplanted organ has been maintained in good condition for at least a year. Even pregnancy has occurred occasionally. In homoplasmic and heteroplasmic cases the most varied results have been reported. The author instituted four series of experiments in dogs and guinea-pigs. He was careful not to injure the ovary, and removed a bit of the tube with it. There were fifteen guinea-pigs and thirty-two dogs operated on. In one series the ovary was removed and transplanted into the same individual. In another series the left ovary of one individual was transplanted into the left peritoneum of another individual. In the third series the ovary of one species was transplanted into the other. The fourth series was the transplantation of one ovary into the neighborhood of the testicle of another animal. After the death of the animals the ovaries were care-

fully examined. After a period of degeneration the ovary enters on a stage of regeneration. This regeneration is noticeable as early as the fourth day after operation. The uterus, tubes, and mammae were found in good condition when the transplanted ovary grew. Pregnancy was never secured. The author concludes that ovarian transplantation is possible in animals and may be hoped for in man.

Treatment of Retroflexion of the Uterus by the General Practitioner.—Stoeckel (*Berl. klin. Woch.*, Nov. 27, and Dec. 4, 1905) tells us that we have passed the epoch of extreme operations for retroflexion of the uterus and have arrived at a more conservative time. This epoch had its advantages and disadvantages. The author believes that in uncomplicated cases of retroflexion the treatment should be left in the hands of the physician, who can treat it better by conservative methods than the surgeon can by operation. Not every case diagnosed needs correction. Many cases are entirely without symptoms, especially in virgins and old women. When there are bladder symptoms, backache, menorrhagia and leucorrhea, treatment is demanded. The author uses a pessary when there are no adhesions, which is often sufficient to give relief. When there is pregnancy with retroflexion it becomes necessary to replace the uterus by gentle bimanual manipulations before introducing the pessary, and to have the patient lie in bed on the side until the uterus has risen above the promontory. Incarceration means gangrene of the uterus from pressure. The beginning of this is indicated by severe bladder complications. A catheter is placed in the bladder and the patient put to bed; after a few days an attempt is made to replace the uterus. No narcosis is necessary. The author seizes the vaginal portion of the uterus with forceps, pushes it forward, pushes the fundus up with two fingers of the other hand, and then draws back the cervix. As to the effect of retroflexion to produce sterility the author thinks we have no accurate knowledge. In some cases pregnancy takes place after reduction of the deformity. Many cases are caused by the gonococcus. Whether retroflexion is responsible for hysteria is undecided; the application of a pessary often gives relief to the nervous symptoms. The handling of the uterus must be skilful, and the pessary used well-fitting. When severe pain is produced by manipulations it is time to stop. The sound should seldom be used. The author prefers the form of pessary that is offered by Fritsch, as thin as the Hodge and as much bent as the Thomas pessary. Douches are necessary only when there is much leucorrhea. The pessary should be removed and cleansed every month, after menstruation. The best operation, when conservative treatment is not successful, is the Adams-Alexander operation for shortening the round ligaments. When complicated by prolapsus, operation is generally necessary. When there are diseases of the adnexa, salpingitis, tumors, etc., the treatment

by pessaries is inapplicable. Pain on handling and severe leucorrhea are symptoms indicating such complications. The symptoms are due to the complications, not to the false position. Glycerine tamponade, rest in bed, etc., must be used, and operation later if no relief is obtained. Local heat, massage and vibration are of value later. For the poor working woman we must council operation, as she cannot spare the time or strength for long treatment.

Uterine Sarcoma a Rare Disease.—Theodor von Wenzel (*Zent. f. Gyn.*, Dec. 9, 1905) describes sarcoma of the uterus as a very rare form of malignant disease of that organ. Gurlt found 2 cases of sarcoma among 2,649 uterine growths, while there were 1,572 carcinomata, and 883 fibromata. Roger Williams found 8 cases among 4,115 growths. Contrary to the accustomed location of carcinoma in the cervix, sarcoma occurs generally in the body of the uterus. Poschman gives 377 carcinomata of the cervix, against 10 of the corpus uteri, while there were 11 sarcomata in the fundus to 5 in the cervix. Krukenberg gives 19 in the fundus to 1 in the cervix. The sarcomata arise from the mucous membrane in most cases, less often in the substance of the wall, when they result from the degeneration of a fibromyoma generally. Primary origin of sarcoma in the uterus is so rare that during 15 years no such case has been reported. Most of the sarcomata of the uterus are spindle-celled, much less often of the small round-celled variety. The author has observed a case of sarcoma of the cervix, the rarest form of this variety of tumor. It arose from the wall of the uterus, not from the mucous membrane, and was a primary growth, not a degenerated myofibroma. It was of the round-celled type. It occurred in a woman 46 years of age, as a round, soft mass in the vagina, mostly covered with normal mucous membrane. A portion of the tumor was removed and examined, and then the extirpation of the entire uterus was undertaken successfully.

Scopolamine-morphine Narcosis in Gynecological Operations.—Karl Voigt (*Monatsschr. f. Geb. u. Gyn.*, Dec., 1905) describes the disadvantages of exploratory examinations under ether narcosis, and states that scopolamine-morphine narcosis has a definite place in gynecological practice in order to prevent the shock and fear occasioned by the giving of ether twice, for examination and again for operation, as well as by enabling the patient to avoid the possible fatty degeneration produced by ether. It is also applicable in cases of exsanguinated and cachectic individuals, with heart complications. A third indication for its use is in operations like perineorrhaphy, colporrhaphy, Alexander-Adams operation, and such others as are not of a serious and vital nature. It is of value to the patient to avoid the use of ether in such cases. In many operations which require long narcosis it is possible to shorten the giving of ether and to do a large part of the less important

work under the influence of the morphine-scopolamine injections. In most laparotomies the use of this method will do away with the retching and vomiting which are so great a disadvantage to the integrity of the wound after operation. The patient will usually sleep quietly for some time after the operation, and will rarely vomit or struggle. The author gives a résumé of 80 cases in which scopolamine-morphine injections were used by him, at the clinic in Jena, in most of which he found it necessary to give some ether in addition, but much less than was usually given when it was used alone. He administered a 1 per cent. solution of morphine with a solution of scopolamine of one-tenth of one per cent. strength. A preliminary injection was given the night before operation to test its effect on the patient. Two and one-fourth hours before the operation he injected one-third of a syringe of scopolamine solution and one syringe of morphine solution; an hour later the dose was repeated and a quarter of an hour before operation the same dose of scopolamine and half the dose of morphine was given, so that the patient got gm. 0.001 of scopolamine and gm. 0.025 of morphine. The cases included operations of all degrees of severity, including laparotomy. One hundred separate operations were done, only six of which were done without any ether. In most cases it was necessary to give the ether before scrubbing the patient, as this causes resistance and pain. The narcosis was much shortened because the tolerance point of the chloroform-ether narcosis was very soon reached, and a small amount of narcotic was sufficient to keep the narcosis perfect, and the mask could be removed some time before completing the operation, some thirty minutes sooner than with ether alone. When the first injection was given the patient's face became red and the skin hot and dry. The pupils generally dilated, and the patient complained of thirst. She soon fell into a quiet sleep, from which she could be aroused by speaking, and generally gave sensible answers at once. In some cases there was dullness of the sensorium. After the later injections the face was slightly cyanotic, muscle tone was lessened, respiration regular and deep. Disinfection was well borne until the stage of washing with alcohol was reached, when chloroform was given. There was never any coughing, retching or vomiting, the secretions in the throat being much diminished, and the sleep much more peaceful and natural than usual. The patient soon awoke after operation, and was rational, and without pain or nausea. In a few cases there was mild delirium. There was an acceleration of the pulse, sometimes very marked. Blood pressure was not much affected, slightly lowered in a few cases. The author concludes that this form of narcosis is not sufficient for major operations, but is of great assistance when combined with ether and chloroform. The patient is quiet and contented, the danger of bronchial inhalations of secretions is done away with. The weakest point of the scopolamine narcosis is the uncertainty of its action.

Bier's Treatment in Gynecology.—J. Eversmann (*Zent. f. Gyn.*, Dec. 2, 1905) advocates the use of the suction method, used by Bier, in the treatment of gynecological cases by which a congestion of the cervix is produced by exhausting the air from a glass speculum placed over the cervix uteri. The speculum should be of glass so that all the tissues treated may be seen while the vacuum is in action. A tube is attached to one side so that the air in the speculum, whose mouth is placed tightly over the cervix, may be exhausted with a small pump. The action is much like that of the breast pump. It produces a congestion of the cervix, and an extraction of the fluids contained in the uterine cavity and the tissues. The treatment is carried out for thirty minutes at a time daily or alternate days. The amount of suction may be regulated according to the condition to be treated and the tolerance of the patient. The treatment is of the greatest value in all forms of endometritis, producing a marked discharge, while some blood usually escapes from the tissues. The hyperemia and the extraction of fluids are both of value in these condition, the latter increasing the circulation and the amount of repair of the tissues. The feeling of pressure and bearing down in the uterus is relieved. Adhesions in the cul-de-sac of Douglas are absorbed under this treatment, although the author cannot account for this effect. Amenorrhea, dilatation of the os uteri and liability to abortion are also benefited.

Morphology of the Blood at the Catamenial Period.—Enrico Ricca-Barberis (*Arch. pen. l. Sci. Med.*, Vol. XXIX, N. 1) gives the results obtained by him in the examination of normal and of irregularly menstruating women, as to the blood conditions to be observed at the menstrual period. He noted two periods of changes in the blood. The first period began six or seven days before menstruation, thus corresponding with the supposed ovulation period, and at this time the blood showed the characteristics of chlorosis. The changes were these: the amount of hemoglobin was diminished, while the number of blood corpuscles remained normal; the globular value was lessened; the isotonic resistance was diminished; the corpuscles which color with methylene blue and the erythro-cyanophylic corpuscles were increased in number; polynucleated lymphocytes were diminished and the small lymphocytes were increased in number; eosinophiles were diminished or increased in different cases. The second period of changes was after menstruation had ceased and was characterized by a simple anemic condition, the result of the loss of menstrual blood. The same changes went on in cases of amenorrhea, and of non-menstruating cretins, showing that they take place as long as ovulation occurs, whether menstruation continues or not.

Lactic Acid in Gonorrhea.—Swithin Chandler (*Your. A. M. A.*, Oct. 7) has gotten very satisfactory results from injections of

lactic acid in cervical gonorrhea. He first cleanses the vagina and cervix and draws down the cervix and injects pure lactic acid under the membrane, a few drops only at one point, until the whole surface is exposed. The writer claims that this method will cure cervical gonorrhea and has no ill after-effects. It will stop the spreading to the endometrium in acute cases. It is better to destroy the cervical glands, and this should be done as soon as diagnosis is positive.

DISEASES OF CHILDREN.

Epidemic Cerebrospinal Meningitis.—Hugo Schottmuller (*Munch. med. Woch.*, Aug. 22, 29, and Sept. 5, 1905) discusses cerebrospinal meningitis as seen by him in the wards of Lushortz in Silesia, fifty cases having been treated since 1895. The author believes that the cause of true cases of cerebrospinal meningitis is the micrococcus of Weichselbaum. He questions whether we should not properly discard the name of epidemic cerebrospinal meningitis, since the cases generally occur sporadically, rather than epidemically. When they do come together it is usually a certain house or building, such as a barrack that becomes affected. It occurs at certain seasons of the year, especially in the winter season, or spring. The pneumococcus, streptococcus mucosus, etc., may account for some few cases of the disease, but in the majority of cases the Weichselbaum microorganism is the real etiologial factor. Of the author's forty-nine cases, all were examined bacteriologically, the cerebrospinal fluid extracted by lumbar puncture being the material used for examination and for cultures. It is very necessary to avoid all contamination of the fluid when removed, and to have a relatively large amount for examination, since in most cases the micrococcus is not found in large numbers. The microscopical examination of the sediment showed polymorphonuclear leucocytes, and but few lymphocytes. In most cases the diplococci were found free as well as in the cells; never were they so numerous as are pneumococci in that form of meningitis. The severity of the disease bears no relation to the number of germs found. The cocci are found usually with the beginning of the fever and continue as long as that lasts, whether the disease goes on for weeks or months. Generally there is a positive result from examination on the second day of the disease, and they have been found after four months of illness. In most cases a positive result was obtained from cultures, and the virulence was demonstrated. In three cases there was a mixed infection, with the tubercle bacillus in one case, streptococcus mucosus in another, and pneumococcus in a third. All of these cases gave like cultural and morphological results. Outside the human body the micrococcus is easily destroyed. It is directly communicated from man to man, being transmitted by way of the nose to the lymphatic channels and thus to the meninges. The fingers play the prin-

cial rôle in carrying the germs from one person to another. When the organisms take on a highly virulent type an epidemic is produced. Of the patients observed one-half were children, who are more susceptible than adults, especially when of tender age. The onset was sudden with few prodromal symptoms. Chills and fever were always present, head and spinal pain, retraction of the head, somnolence to coma, delirium or convulsions. Few of the cases were acute, most being really subacute, and none abortive. Vomiting always occurred, emaciation was marked; the fever was not characteristic in form or curve, usually remittent. Herpes of lips, nose or mouth was common. The pulse was rapid. Leucocytosis of the blood was constant. The reflexes varied. The diagnosis is established by bacterial examination from pneumonia, typhoid and septicemia. No treatment seemed to avail except lumbar punctures, which gave relief from pain and nervous symptoms.

Prevention of Ophthalmia of the Newly-Born.—J. C. Edgar (*Med. News*, Sept. 23, 1905) believes that when gonorrhea of the mother is suspected, the maternal passages should be treated for about two weeks before delivery by daily or twice daily vaginal douching, first with a mild alkaline solution and then with one of 1-5000 bichloride. Just before delivery a one-per cent. lysol douche should be given in order to provide a substitute for the lubricating mucus which has been washed away. The writer employs Crede's nitrate of silver method in all cases, both hospital and private. He has found that solutions of less than two per cent. do not destroy bacteria, while those of three per cent., though otherwise harmless, are likely to cause conjunctivitis. Experimentation in hospital practice has convinced him that protargol and argyrol are less efficient than silver nitrate.

Baby Incubators.—John Zahorsky (*St. Louis Cour. Med.*, Oct., 1905) states as a general rule that infants weighing less than 1200 grams should remain in the incubator about two months; those weighing between 1200 and 1500 grams require to remain for six weeks, while those of 1500 to 2000 grams should be kept in it from three to five weeks. Infants of more than 32 weeks' gestation and weighing more than 2000 grams (four pounds) need no incubator.

Disorders Associated with Primary Dentition.—Dentition, says Leonard Guthrie (*Practitioner*, Oct., 1905) is a physiological process, and as such is often accomplished without disturbance of the infant's health. It would be strange if teething did not often coexist with every illness in infants aged from eight to twenty-four months, and the writer is convinced that in the majority of cases teething is a mere coincidence. He believes that the ordinary phenomena of painful dentition are dependent on alimentary disturbance, and that dentition is painful because the gums become unhealthy. If this is so the treatment of the condition includes rendering the mouth aseptic,

attention to diet, and correction of digestive disorders by such drugs as castor oil, rhubarb, laudanum and salol. Local pain may be relieved by blood-letting. Simple scarification of the gum is all that is needed. Excision of a portion of the gum above a tooth is illogical, for if the condition of the gum were due merely to tension, a simple incision would gape at once and so relieve the symptoms.

Eye Defects Associated with Puberty.—K. K. Wheelock (*Med. Record*, Oct. 21, 1905) calls attention to a group of cases in patients of eight to ten years of age characterized by defective vision for distance and reading, limitation of field for form and color, with absence of chlorosis and of hysteria and presence of leucocytosis. Sight for reading and distance is recovered, with much contracted field, but complete restoration of sight and field occurs only after establishment of the menstrual function in the female and the seminal function in the male. There may be some relation between this condition and chorea. Treatment with iron, strychnine and manganese is best.

Spinal Caries with Compression Paraplegia.—After briefly discussing the etiology, symptomatology and diagnosis of this condition, G. W. Howland (*Canada Lancet*, Sept., 1905) gives the statistics of the results of treatment of 200 paraplegic cases upon 77 of whom laminectomy was performed. Of the mild cases of compression, who could walk and perform all movements of the legs with ease on admission, 37 were cured, 6 improved, 9 unimproved, 2 died. Of the severe cases not operated upon, those who could move the legs but slightly or not at all on admission, 27 were able to walk out, 7 were improved, 20 unchanged, 14 died. Of similar severe cases operated upon, 24 were able to walk out, 15 much improved, 17 unchanged, and 21 died. While the results were better in the non-operated cases it must be remembered that the worst cases are usually those submitted to operation. The writer lays down the rule that operation in spinal caries with compression paraplegia should be undertaken in only severe cases which are bedridden. Any improvement contraindicates operation, and sudden increase of symptoms may favor it.

Acute Anterior Poliomyelitis.—From the clinical and pathological study of a case occurring in a boy of 16 and a review of the literature, T. A. Hoch (*Four. Nerv. and Mental Dis.*, Sept., Oct., 1905) concludes that the disease is the result of a primary inflammatory affection of the blood vessels of the cord, which may be thrombotic or embolic. The destruction of the ganglion cells is secondary and depends in part upon the deficient blood supply of the diseased area and in part upon pressure and toxins. The pathological changes in children and adults are apparently identical and dependent upon similar causes. Evidence seems to show that the disease is usually infectious, not depending, however, upon a specific microorganism but resulting from bacterial infections of various kinds, and at times from

other poisons. The inflammatory changes are present in the peripheral vessels as well as in the branches of the anterior spinal artery, though these changes are seldom visible until the vessels enter the gray matter. The inadequate collateral circulation within the anterior horns is favorable for sluggish circulation and embolism.

Brachial Birth Palsy.—From a study of the literature and pathology and of seven operative cases, L. P. Clarke, A. S. Taylor and T. P. Prout (*Amer. Jour. Med. Sci.*, Oct., 1905) offer the following conclusions: 1. The cause of the laceration type of birth palsy is tension on the nerve trunks, which first ruptures the nerve sheath and then the nerve fibers. The prevention of this serious lesion of the cervical nerve trunks rests with the obstetrician, who should not overstretch the child's neck in the process of delivery. 2. The persistence of the palsy is clearly explained by the pathological findings, viz.: (a) Rupture of the perineural sheath with hemorrhage into its substance, resulting in the formation of hematoma or hematoma infiltration into the neighboring tissues. (b) The cicatricial contraction following organization of the blood clot and repair of the rent in the perineural sheath. The connective tissue thus formed indents and presses upon the nerve bundles, strangulating them and preventing regeneration of the nerve fibers. In some instances the same result is accomplished by the turning inward of the perineural sheath upon the nerve bundles. 3. The nature of the lesion in all cases demands excision of the damaged areas and suture of the divided ends as soon as it is proven that spontaneous repair will not take place. The plan of treatment is then the same as that for peripheral nerve injuries elsewhere. 4. In all cases such treatment as will prevent contractures and deformities and maintain muscle tone in the paralyzed limb should be systematically used until either spontaneous recovery occurs or operation is done. (Traumatic neuritis is a contra-indication to active treatment.) The above measures should be continued after operation. 5. The proper time for surgical interference is not yet definitely fixed. At the present time one year would seem to be a reasonable delay before operation. 6. Sufficient time has not elapsed in the majority of the author's cases for final results to have appeared. At the end of eighteen months in two cases the improvement in nutrition, range of motion, and muscle power in the paralyzed limb have been sufficient to demonstrate the value of the operative procedure.

Birth Paralysis of the Lower-Arm Type.—J. J. Thomas (*Bost. Med. and Surg. Jour.*, Oct. 19, 1905) records two cases of bilateral birth paralysis of the lower-arm type. He has found only 16 cases in the literature, 12 of which were bilateral. Of the bilateral cases all were breech presentations except that of Jolly, which, like the author's two cases, was a face presentation. The writer confirms the opinion of Jolly that the brachial plexus is injured in these cases by stretching due to over-extension of the head.

THE AMERICAN
JOURNAL OF OBSTETRICS
AND
DISEASES OF WOMEN AND CHILDREN.

VOL. LIII.

MARCH, 1906.

No. 3

ORIGINAL COMMUNICATIONS.

**ASSOCIATED NERVOUS CONDITIONS IN GYNECOLOGY,
WITH ESPECIAL REFERENCE TO THE CLIMACTERIUM AND ALLIED STATES.**

BY

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IN addition to reviewing some of the physical and predisposing bases of nervous conditions, it is the purpose of this paper to see whether the study of the "nervous symptoms" of many women coming for gynecological treatment will enable us to determine, in at least a certain proportion of the cases, a physiological basic cause peculiar to the sex and of a nature which can be fairly well defined.

Predisposition of Sex.—W. H. Freund says, "That many functions in the physical and mental life in women form predisposing factors is of course readily recognized. Among other things, neuralgias, which, as is known, occur often enough with all possible conditions in the life of the female, have their basis in the oft-mentioned local processes, in the coexisting disturbances of nutrition, and in the variations of metabolism. General disturbances of nutrition, as they occur in women's

diseases, furnish further a high degree of *predisposition*. Here also chlorosis and anemia stand at the head. Loss of blood and secretions, poor digestion following severe diseases, cachexia and early senescence are also to be mentioned. All these moments may also serve as the *foundation* of neurasthenia and hysteria, and in fact we not infrequently will find neuralgias on a hysterical basis in relation to the changes of the female genitalia.

"As regards those forms of hysteria which stand beyond doubt in direct relation to the sexual processes and to pathological changes in the organs of the pelvis, we can only then find an explanation if we recognize a strong *predisposition* in the mentioned changes, as in congenital and acquired chlorosis and anemia, in direct injuries, inflammatory changes and infections of the genitalia, finally in sexual over-excitement with frequent atony of the pelvic and abdominal organs and in the psychic changes. Of importance, in addition, is also hereditary tendency, congenital irritability of the nervous system, unsuitable education, 'imitatory contagion' (Änsteckung), with or without the association of physical influences."

General Conditions.—The diagnosis of local pelvic abnormalities as the causative factor of nervous symptoms, especially *through reflex channels*, is one to be made with care. Many general conditions are to be looked for. A thorough examination often shows hysteroptosis, enteroptosis, gastro-enteroptosis, ren mobilis, etc., to be responsible for many annoyances attributed to uterine malpositions, to cervical lacerations, etc. Many have pelvic pain due to unrecognized parametritis, to slight degrees of salpingitis, perioophoritis, etc. Many suffer from rheumatism, and autointoxication. Headaches and neuralgic pains are frequently due to nodules and deposits in various portions of the body which may be removed to the vast benefit of the patient by persistent massage.

Many suffer from headache because of enteroptosis or hysteroptosis or parametritis or pelvic congestion. Women often have annoying symptoms, which depend on a faulty and diminished excretion of urea or are due to lithemia. This extremely important condition in women should always be looked for. I refer to diminished excretion of urea, a state which is productive of many nervous symptoms.

Diminished Excretion of Urea.—The amount of urea output in women is often below the normal. In such states various "nervous symptoms" are often present. W. H. Thompson

mentions among the symptoms of deficient urea excretion, "headaches, mental depression, severe neuralgias, constantly shifting from one part of the body to the other, all kinds of paresthesias, somnolence, alternating with insomnia and a sense of general prostration, especially in the morning, and also in some instances of polyuria." Thompson says that these cases are generally diagnosed as hysteria or neurasthenia.

All these and many other conditions, when not recognized, often lead to a diagnosis of reflex neurosis, of hysteria or neurasthenia. There must also, of necessity, be cases of genuine hysteria and especially cases of neurasthenia in whom gynecological diseases are present. On the other hand, we find the diagnosis of nervousness or hysteria or neurasthenia frequently made in patients in whom truly pathological local disturbances are the undoubted cause of the painful symptoms. There are also many cases without sufficient palpable local cause, who have hysterical and especially neurasthenic symptoms, whose condition is probably due to disturbance of ovarian function.

It is hard to definitely put many of such cases under distinct heads. (1) We all have seen numerous women who have borne children, worked hard, and who have never had physical or nervous annoyances at any period of their lives. (2) We know others who, for causes mainly inflammatory and circulatory, have constant physical pelvic disturbances without nervous manifestations. (3) We see numerous others who, combined with these local pelvic disturbances, evidence nervous phenomena of greater or lesser variation. (4) Another large class is formed of those who, without local *tangible* changes of a character which in our opinion may be called a cause, have nervous annoyances of a greater or lesser degree. It is the two latter classes to which, naturally we desire to direct attention.

Chlorosis.—Among the symptoms of chlorosis are "irritable heart, dyspepsia and constipation, due to atony and passive dilatation of the stomach and intestines. There is easy exhaustion and fatigue of the skeletal muscles. There is a general sense of languor and lassitude. There is a great variety of spinal aches. Reflected neuralgias result from pressure on the spinal roots because the vertebræ are not kept in normal condition by the weakened muscles."—Thomson. (Case II.)

Chlorosis is an illness often hereditary, occurring exclusively

in girls, most frequently during the years of development and the years immediately following, and showing a tendency to recur. No theory with regard to chlorosis which leaves out of consideration its occurrence in girls only, at the time of or in connection with, sexual development, deserves attention. It occurs most frequently between the fourteenth and twentieth years. According to Niemeyer, such cases as occur after the twenty-fourth year are almost never chlorosis.

In chlorosis there is often associated a poor development of the genitalia. The pelvis in a certain proportion of cases is of the child's type; in others there is a poor development of the external genitalia, or a uterus infantilis, small ovaries, poorly developed breasts, etc. Seventy-four per cent. have failures of genital development of one form or another. Among nonchlorotics these conditions are found in only 24 per cent. Menstruation is, as a rule, disturbed. During the chlorosis there is very frequently absolute or relative amenorrhea. Those affected with menorrhagia always show a decided change in the mucosa. In all, 77 per cent. present a weakening of the menstrual function.

Thomson believes the inference to be clear "that chlorosis is in some way related to the function of ovulation, and the problem is to find what this relation is."

A justification for the statement that chlorosis is due to diminished ovarian secretion is furnished by the effects of ovarian therapy in these cases. It may be considered that in chlorosis, with a failure of proper stimulation of the uterus and its lining, a diminished menstruation prevents thereby an excretion through the menstrual blood of toxins produced at puberty. There may likewise, at this stage, be a certain antagonism between the thyroid gland and the ovary. Since many of the cases of chlorosis present symptoms not unlike those found in Basedow's disease, it is possible that a too greatly diminished secretion of ovarian extract causes a relatively increased amount of thyroid extract to circulate in the blood. For this speak the good results obtained by Seeligman and others in the treatment of typical Morbus Basedowi with ovarin. The ovarian secretion is a stimulator of blood formation, and causes a congestion of the genital organs. Thyroid extract on the contrary, causes anemia of the genital organs, as is seen in the good results obtained by the treatment of the uterine fibroids with thyroid extract. It is possible that those chloroti c

patients who take on fat have not alone a diminution in the function of the ovary, but likewise a diminution in the function of the thyroid, while those suffering with the symptoms of Morbus Basedowi, have a diminished secretion from the ovary, but an over-secretion on the part of the thyroid gland.

Menstruation—Pregnancy.—The ovarian secretion produces every twenty-eight days a pelvic congestion which is relieved, if no impregnated ovum is present in the tube or uterus, by a flow of blood from the uterine lining known as menstruation. Associated with this local congestion is a general congestion in the entire body, especially located in the various mucous membranes. This general congestion has naturally an irritating influence, and is more than apt to increase any annoyances existing in the sensitive portions of the body. It increases the tendency to skin affections; it increases the tendency to headaches and to neuralgias, and it increases any tendency to excitability, mild hysterical attacks, etc. These results are due to the perfectly physiological constitutional congestion which occurs and which is associated with menstruation.

The congestion occurring in menstruation is, of course, carried on continually through the period of pregnancy, and, while there is no absolute rule in the matter, it is quite sufficient to increase the same tendency to annoyances as is observed in the congestion of menstruation. In addition to this we must remember that the placental secretion is an added element present in the blood of the mother and that it may and does, in numerous cases, add further annoying symptoms to the expected physical discomforts, which generally accompany that state. The feeling of nausea, the morning vomiting, the emesis and the hyperemesis are all annoying factors associated with pregnancy, especially in the early months, and are in all probability due to the action of placental secretion. Nervousness, nervous annoyances resembling "hysterical symptoms," chorea, etc., are recognized possibilities in the course of pregnancy. It is evident to everyone that women with nervous symptoms are not infrequently made worse by the metabolic changes associated with gravidity. (Case III.) That women who are pregnant are liable, for emotional or other reasons, to the same general nervous annoyances as non-pregnant women are, is of course not to be controverted. On the other hand many women feel better during, and especially after a pregnancy, than they did before. Even in pregnancy,

symptoms resembling hysteria or neurasthenia occur in women who formerly showed no evidences of these conditions, and it is quite probable that the same causes (relation between the ovary and the thyroid) as are to be mentioned further on are here responsible for these changes. (Case 18.)

In speaking of Graves' disease, Thomson says: "It is difficult to imagine why the thyroid itself should so differ between the sexes as to account for the preponderance of women; but it is quite otherwise when we take into account the proneness of women to gastrointestinal derangement in connection with menstruation, pregnancy and the menopause. In each of these conditions digestive disorders frequently occur, with nervous accompaniments not unlike in nature to the incipient symptoms of Graves' disease."

We need only refer to the experiments which have been made on pregnant rabbits showing that in them the nervous system is much more excitable than in the rabbits non-pregnant. The same sensitiveness of the nervous system is beyond doubt present at menstruation and most assuredly is this the case during pregnancy. It needs only casual mention to recall the fact that even to-day many consider the nausea and emesis of pregnancy to be due to hysteria, and that some observers have noted the stigmata of hysteria in such cases. We here again repeat that, while the condition of pregnancy and its associated excitability naturally aggravates nervous conditions, yet the nausea and vomiting of pregnancy are due to metabolic changes occurring in that state, and that among the poisonous products is probably the irritating additional placental secretion.

Onanism.—Onanism must be reckoned among the factors which would predispose to increased irritability of the nervous centers. Koblanck found that all of 30 cases of amenorrhea confessed to masturbation. Sixteen were married, and of these eight had borne children. The duration of the amenorrhea varied from three months to several years. The symptoms were headache, nausea, dyspnea and sleeplessness. The tendency to masturbation was especially strong at the time for menstruation. Further, attracted by the observation of Fleiss, he noted that many disturbances in the menstrual function, especially dysmenorrhea, are associated with circumscribed swellings of certain nasal areas, namely, the anterior end of the lower turbinated bone and the directly opposite area of the nasal septum. He found that this was produced by strong

sexual excitement unaccompanied by the relief resulting from physiological completion of this state. For the treatment of amenorrhea, the stopping of the masturbation is a necessary factor. He also observed that menorrhagia was often due to masturbation and to disturbances of a sexual character. Sixteen women with menorrhagia and metrorrhagia acknowledged abnormal sexual processes (especially interference with natural completion), due to a desire to prevent conception. The symptoms improved with the regulation of the sexual relation. These disturbances resulting through masturbation in the non-gravid, open to him the question as to the possibility of evil results in the pregnant. He observed that unconscious eclamptics often practised onanism. He found in these eclamptics nasal swellings and enlargement of the left thyroid lobe. He questioned 20 women who recovered from eclampsia, and 19 confessed to onanism in pregnancy. The desire to masturbate was observed in those who practised onanism before marriage as well as in those who had not made use of this practice before.

In the opinion of some, masturbation does not act injuriously through mechanical irritation, but does act injuriously psychically. It may be said, however, that masturbation does produce congestion, which is not relieved and regulated by the omitted orgasm. How are the anomalies of menstruation, masturbation and psychic disturbances related? If masturbation produces amenorrhea, or disturbances of menstruation, we may infer a consequent interference with ovarian secretion and its elimination. If we grant that masturbation has an effect on menstruation, we may safely add psychic phenomena to the list of resulting evils. On the other hand, it may be asked whether masturbation is entirely a cause or a symptom, and whether onanism and amenorrhea are not often evidences of defective ovarian action and secretion or of defective mental and nervous organization. At any rate, we may grant that increased irritability is an accompaniment of onanism. More especially would this be true in the case of the pregnant woman.

Ptoses.—In the *Medical Record*, November 24, 1900, the writer expressed the opinion that among the gynecological cases deserving conservative treatment are certain forms of metritis, parametritis, pelveo-peritonitis, salpingitis, hydrosalpinx, pyosalpinx, etc. "A large proportion of cases have these affections to a slight degree, but combined with them are displacements

of the uterus and adnexa, with chronic congestion or venous stasis in the pelvis, with *reflex and constitutional symptoms*. Not infrequently *ren-mobilis*, *gastroposis* and *enteroptosis* are found *co-existing*. These patients often possess a flabbiness and lack of elasticity which is by no means the result of the gynecological condition, so that we are compelled to consider the latter as *part of a general state*. From the gynecological standpoint we name this condition hysteroptosis. These various conditions are, through local treatment, open to improvement. If, combined with local treatment, *attention is given to existing weakness, anemia and circulatory disturbances*, then we obtain decidedly better results. Conditions such as rheumatism, gout and auto-intoxication must be taken into consideration."

It was my opinion that, among cases deserving of conservative nonoperative treatment, there were many in whom there was present, in addition to a local genital subinvolution, a general constitutional subinvolution, that is, a failure after labor in the return to the normal on the part of the various intra-abdominal ligaments, of the abdominal muscles and of the *general elastic and circulatory tone*. I believed then, and do more firmly to-day, that many of the symptoms due to such conditions in women are erroneously attributed to uterine versions and flexions and to minor genital pelvic changes acting through reflex paths and also to hysteria or neurasthenia. A frequent obstacle in the proper care of these cases is the firm belief on the part of many patients that a gynecological trouble is solely responsible for their general nervous condition. It is certain that many women suffering from abdominal and pelvic ptoses are considered to be hysterical or neurasthenic or nervous. The symptoms described by Glénard are (1) debility and lassitude, (2) sensations of uneasiness, weight, dragging, craving, emptiness, etc., in the abdomen; (3) symptoms of dyspepsia; (4) nervous symptoms. The relation formerly considered to exist between *ren-mobilis* and the general nervous condition of the patient is now recognized to really exist between a combination of abdominal ptoses and a general state. It cannot be said that abdominal and pelvic ptoses cause neurasthenia, yet it may be said that neurasthenic patients are prone to abdominal ptoses, that Glénard's disease and neurasthenia are sometimes combined. It can be said, moreover, that abdominal ptoses and pelvic ptoses often are productive of "neurasthenic symptoms," and that many patients suffering

from abdominal and pelvic ptoses do have symptoms which, especially if the cause be not recognized, can readily lead to a diagnosis of hysteria or neurasthenia. One has only to consider the relief afforded by abdominal support, by hydrotherapy as well as by local therapy, to see the relation of this general state of symptoms, often attributed to pelvic conditions or to neurasthenia. This benefit is well illustrated by the successful treatment of cases by hydrotherapy as reported in the *Medical Record* of November 24, 1900. (Case IV.)

It is of special interest in this connection to quote the following observations of Abrams; he says: "Nervousness, while expressive of an enfeebled nervous system, is an expression evoked by some irritation somewhere in the organism other than in the nervous apparatus." He has described a special form of nerve weakness designated as *splanchnic neurasthenia*, which is characterized by paroxysms of depression of varying duration, and which are specified popularly as the blues. "Splanchnic neurasthenia is above all things characterized by attacks of depression, which come on spontaneously without apparent cause and depart as mysteriously as they came. An attack of the Blues is naught else but an acute neurasthenia, or a periodic exacerbation of chronic neurasthenia."

Abrams believes that many cases of neurasthenia have an abdominal origin, and that the neurasthenia may be referred to a defect in the nerve apparatus which controls the supply of blood in the abdominal cavity, and that this condition is eradicable by simple methods. "There are a large number of gastric and intestinal affections, with bizarre and protean symptoms designated as gastric and intestinal neuroses, but which in reality owe their genesis to the congestion of the intraabdominal veins." "The greater the intraabdominal tension, the less blood will be contained in the abdominal veins. This tension is largely dependent on the tone or tension of the abdominal muscles. Therefore, nervous exhaustion is a frequent cause of diminished tone of the abdominal muscles, which in turn diminishes intraabdominal tension and conduces to blood stagnation in the veins of the abdomen." "Venous congestion interferes with a proper supply of arterial blood. The tissues and the organs bathed in pools of stagnant blood are practically in a state of asphyxia. The toxic products of digestion, which are normally removed by an unimpeded circulation, have a specifically poisonous effect on the sympathetic system, a

fact which is evident, owing to the frequent occurrence of depression, prostration and nervous symptoms in nearly all disorders of the alimentary canal." "Gastrointestinal disturbances of whatever nature, seriously compromise the integrity of the nervous system, either by inducing neurasthenia or aggravating it, if it exists." "The entire question of splanchnic neurasthenia is one of abdominal plethora, dependent on a variety of causes, notably diminished intraabdominal tension, insufficient lung development, a defective vasomotor apparatus. Splanchnic neurasthenia is one of the few forms of neurasthenia amenable to permanent cure, by measures having for their object, relief of abdominal venous congestion." "In any splanchnic neurasthenia existing as an independent affection, the relief of symptoms almost positively follows relief of the venous abdominal congestion."

Reflex Neuroses.—A point which is of greatest interest is the question of reflex causation in the realm of gynecology.

There is a tendency to refer many or all of the nervous symptoms, especially in married women, to local disturbances in the genital tract, and often not without reason. Since among the numerous cases coming for gynecological treatment, a certain proportion of prolapsed ovaries, cystic ovaries, lacerated cervixes, antelexions, and especially retroversions and retroflexions are found, it has become a very generally accepted principle to consider these as the etiological causes, *through reflex channels* of many and numerous nervous symptoms. That this extreme is an error, in a way, has long been my opinion, and in the study of cases which have come under my observation, I have been loath to attribute to such minor disturbances alone the weighty etiological rôle so widely accepted.

More serious attention, however, is due cases with actual lesions of importance in the genital tract. Descent of the uterus, combined with congestion, inflammatory changes of minor or severe degree, especially those causing marked protracted pain, and those causing anatomical changes in structure, must be considered as possible factors of moment in the causation or accentuation of nervous symptoms. We find many observers who, on this basis, attribute to reflex channels the etiology of symptoms, while others consider the association of pelvic lesions and general nervous symptoms to be a coincidence, while still others consider the local lesions as the exciting cause in predisposed individuals.

In discussing the relations of the female sexual organs to other organs, W. H. Freund says: "It is not always easy to decide whether in conditions occurring at the same time in different parts of the body there exists an accidental coexistence, or a causal relation. The feeling of uncertainty is increased by the fact that quite a number of paths can furnish the connection between the mentioned organs. In general, one thinks first of a connection by means of the cerebrospinal or sympathetic nerves, in spite of the fact that to these there falls an inferior rôle. The connection through the blood and the circulatory apparatus is by far more important."

Freund recognizes the rôle of the ovarian secretion, and states that the relation of the female sexual organs to other organs is mostly accomplished through the blood and circulatory apparatus, as was proven by the experiments of Goltz. (See *Medical Record*.)

The rôle of the *nervous system*, however, is an important one, in his opinion. "In dealing with pathological changes in the vicinity of the nerves of the genital organs, we are often in the position to recognize a primary irritation in palpable form, as nodules, as sclerosing connective tissue, as an inflammatory focus, as a hemorrhage, with the various resulting conditions. The paths are through the spinal cord and the cerebrospinal fibers, but especially through the sympatheticus, by which the genital system is richly supplied."

"As a surely-proven basis of hysteria, we have parametritis chronica atrophicans. Severe perineuritis and neuritis of the nerve apparatus, situated in the broad ligament, have been shown. Numerous other affections in the sexual system, which are again and again brought into causal relation to the occurrence of hysteria, these we can admit in that light only, so far as they appear associated with the well-known and very frequent chronic parametritis."

Freund, who really taught us the pathology of that most important pelvic condition, known as "parametritis atrophicans," made the statement at a meeting of the Berlin Gynecological Association, that where this condition is present, hysteria is never absent. He defines hysteria as "that disease in which there is clearly noted, coming out from the diseased area, and also called forth by examination, *reflex neuroses*, which, according to their place of manifestation, must be called sympathetic or spinal or cerebral. To this neurosis, sooner or later,

is added a psychic reaction, differing according to constitution, inheritance and 'bringing up.' " We see here a definition of reflex etiology not in keeping with the generally accepted definition of hysteria pure and simple.

In the discussion of his paper the following opinions were expressed:

Bröse said that in nine cases of severe hysteria he found in almost all of them parametritis atrophicans. He makes the diagnosis through the stigmata of Charcot. One patient with all the objective and subjective symptoms of hysteria and hysterical delusions, had parametritis atrophicans. He fears that she will end in the insane asylum. In a second case he did a ventrofixation, and all the local and hysterical symptoms disappeared, although for weeks after the operation the patient suffered from hysterical vomiting. There are many patients who have hysteria with objective symptoms, even after the correction of the displacements. The reflex neuroses of a retroflexion, have, in his opinion, nothing to do with hysteria. Chronic adnex troubles, without parametritis atrophicans, do not cause hysteria. He believes chlorosis to be a cause of hysteria, and considers hysteria a secondary condition, and not a true psychosis.

Olshausen said that hysteria is a psychosis, and that reflex neuroses do not constitute hysteria. There are, however, certain local lesions which do cause this condition, and he mentions the case of a girl 20 years old with severe hysteria and epileptiform attacks, occurring every night at 8 o'clock. In spite of isolation and various attempts to deceive her as to the time of day, the attacks occurred regularly at the same hour, and he removed her ovaries and the patient became well. He believes that bad bringing up and the production of spoiled children, especially where the will of a child is never controlled, are often the cause of hysteria, and that it makes its appearance at puberty.

Koblanck said that he saw many neurasthenias but few hysterias. He believes that sexual disturbances are a frequent cause of nervous conditions.

Mackenrodt finds the most important form of cause in the field of the sexual organs. He had a case like Olshausen's, which was cured by operation, and stated that Sängner made the same observation in many cases in the Leipzig Insane Asylum. Mackenrodt finds with Freund's disease many neurasthenic

symptoms. The local condition acts for years, until a strong irritation occurs and a psychosis results.

Shaeffer finds that retroflexion, combined with ren-mobilis enteroptosis and loose abdominal walls, are closely related, etiologically, to psychic conditions. In his opinion, all chronic gynecological troubles, especially inflammatory, may give rise to hysteria.

Strassmann is very careful in the diagnosis of hysteria. He referred to causations which come under the head of abnormal sexual relations, not alone physical, but also mental, coitus interruptus, masturbation, marriage with impotents, women not happy in a sexual-ideal way in marriage, women who feel themselves neglected, etc. He does not believe much in Freund's etiology.

Gottschalk says that not every hysterical symptom makes a hysteria, and he speaks of a reflex hysteria, and of a central hysteria. Peripheral lesions may reflexly cause a hysterical picture, but these cases are far in the minority. He believes in the element of heredity, and when the irritating cause occurs, then a hysteria appears. Among the irritating causes are marriage with impotents, masturbation and coitus interruptus.

Lippmann says that hysteria is a disease of the central nervous system, which *in cases with a disposition thereto*, can be started from the most various peripheral parts of the body, through various conditions in those parts, most frequently from the genital system, and sometimes from the ovaries. He referred to a case of hysteria in a girl who menstruated at 12, with pain in the ovarian region. He mentions the fact that for the first year and a-half of the disease the attacks followed the monthly type and then became general. She then developed fibrillary twitchings, temporary contractures, convulsions and finally opisthotonos of severe duration. She was operated on by Schroeder at the age of 26. One ovary contained a dermoid, the other was cystic. The attacks stopped, and in four years she was well.

Steffeck thinks of various combinations. He does not believe that gynecological troubles are the cause, but thinks that the hysterically predisposed individual, through auto or ecto suggestion, comes to believe that there is in a certain spot the injured tissue, which produces the hysterical symptoms, and calls them, if they are to be called hysteria, "*Local or Localized Hysteria.*" True hysteria, he thinks, to be characterized by the

fact that anatomical lesions cannot be found. He believes hysteria to be a true psychic disturbance, through inherited or acquired sensitiveness, as a result of which a pathological reaction occurs with the most varied injuries. He believes that education, adolescence, married life, the character of the husband, etc., are important points in the causation of hysteria.

It can be seen that the views of Lippmann and Steffek are the correct ones, and that they dispose to a great extent, of reflex neuroses and bring us to a realization of the fact that pelvic troubles of varying degrees act sometimes without injury and sometimes with injury upon the nervous system of the female, according to the predisposition of the patient. (Cases 5, a, b, c, d, e, f.) We see here great differences in opinion as to the etiology of symptoms, and most certainly a difference of opinion as to what constitutes hysteria. That many of the cases considered to belong under the head of hysteria are really "neurasthenic," is extremely probable.

It is the firm opinion of the writer that in many cases, and perhaps in those of Freund's disease a possibility other than reflex action should be considered. The points which have to be reviewed concern hysteria, neurasthenia and Basedow's disease, as well as the symptoms of the climacterium and of the artificial climacterium.

Hysteria, "Hysterical Symptoms."—Gowers says that the manifestations of hysteria may be divided into (1) a mental state, (2) motor, and other symptoms. Under the first we have defective power of will, imperfect self-control, inability to resist the impulses of inclination, irritability of temper, undue sensitiveness to annoyances, whereby trifling cares and vexations become grave troubles. Self-consciousness dominates the patient's thoughts, and even her actions. Laughter and tears come readily. There is the globus hystericus. There is increased sensitiveness, hysterical tenderness and neuralgic pain. There is hyperesthesia or lessened sensibility, often in the legs, with motor weakness. There are areas of anesthesia. The ovarian region is often sensitive, as is also the spine. Under other most important symptoms are included: paralysis, spasmodic affections, contractures, spasm, trance, lethargy, retention of urine, palpitations, flushings of the face, vasomotor spasm, fainting and vomiting.

We naturally leave out of consideration the discussion of

hysteria of such a severe nature as to demand a differential diagnosis from other organic nervous diseases. We leave out of consideration the severe causes in which a diagnosis of hysteria is beyond doubt. It can be readily seen that when some of the minor symptoms (palpitation, flushing, vasomotor symptoms, irritability, sensitiveness to annoyances, headache, tenderness, neuralgia, weakness of the legs, etc.) are combined, there may be ready inclination to the use of the term hysterical. More particularly is this true if there be present unrecognized pelvic, abdominal or other lesions which are productive of additional annoyances. If, on the other hand, with these symptoms a minor or major local gynecological trouble is combined, it is easily understood why the diagnosis of reflex neurosis or reflex hysteria may be made. A review of the preceding opinions shows how divergent are the views as regards this question.

According to Clarke, the *stigmata* of hysteria are anesthesia, hyperesthesia, concentric contraction of the visual fields, hysterogenic zones, convulsions. In his work on hysteria, Clarke mentions among the characteristics of hysteria, "Hysterical Disposition—variable moods, emotional excitable temperament. The patients are easily exalted and easily depressed; tears and laughter follow on insufficient cause. An important factor is the way the emotions act on the motor, vasomotor, sensory and circulatory functions. There is a too ready accessibility to passing impressions of the moment. Many patients with severe hysterical manifestations have no sign of this classical disposition, and are quiet and restrained and show little emotion."

"There is *tenderness*, either superficial or deep." The patient is generally aware of it, in contradistinction to anesthesia. There is tenderness often in the ovarian and inframmary regions, in the upper abdomen and vertebral spines.

"*Tremor may be present, which is fine and rapid, like that in alcoholism, or in Graves' disease.* There may be rapid pulse, or *palpitation* with rapid pulse. There may be a persistent rapid pulse. *The diagnosis must be made from the irregular forms of Graves' disease.*

"Irritability of bladder, the patient sometimes passing water twenty to thirty times a day.

"Many patients with hysterical symptoms are quiet and unemotional. Others with hysterical disabilities struggle brave-

ly to fulfill their duties. Most, however, have variability of temper, loss of control of their emotions, short lived enthusiasms and emotional unrest."

Omitting the symptoms of major cases, we find that Osler mentions, among the symptoms of hysteria, "anesthesia usually confined to one-half of the body, hyperesthesia, pain in the head, neuralgias, hysterogenic spots, ovarie, pain in the back, pains in the abdomen simulating gastralgia and gastric ulcers, disturbed or depraved appetite, dyspepsia, gastric pain, flatulence, obstinate diarrhea, diarrhea after eating, rapid action of the heart on the slightest emotion, with or without subjective sensation of palpitation." Leaving out of consideration the element of anesthesia, we find that the remaining symptoms constitute those usually considered under the head of "Hysterical Symptoms." Hysteria is too often diagnosed on the basis of so-called "hysterical symptoms;" *i. e.*, flushing, palpitation, vasomotor symptoms, irritability, sensitiveness to annoyances, flatulence, dyspepsia, headache, tenderness, neuralgia, weakness of the legs, etc.

Gowers says that there are two important points: (1) The relations of the symptoms to emotional disturbances, alike in their commencement, course and manifestation; they frequently follow mental shock, or are gradually evolved under the influence of more persistent emotional disturbance and may be intensified from time to time under the same influence. (2) Mutability of symptoms, whereby grave troubles of one kind cease and give way to other symptoms, such as cannot result from the same organic causes as the first.

Osler says that hysteria is often diagnosed where there is really neurasthenia. "In the absence of hysterical paroxysms, of crises, and of those marked and emotional and intellectual characteristics of the hysterical individual, the diagnosis of hysteria should not be made."

Neurasthenia.—In his observations on neurasthenia Clarke says "Neurasthenia is a nervous disorder without any known alteration in organic structure, characterized by a persistent state of fatigue and hence of weakness of the central nervous system in the absence of the causes which normally are adequate to induce such fatigue, and at the same time by a loss of control on the part of the higher nervous centers, and hence by an excessive reaction in certain directions to slight irritations."

The cardinal symptoms, recurring in different combinations,

and called by Charcot the stigmata of neurasthenia, are, pains in the head, dizziness and vertigo, inability for mental work, various disorders of sleep, irritability of temper, weakness and tremor of the limbs, pains in the back, palpitation, certain forms of dyspepsia, sexual weakness.

Under character symptoms are included, irritability of temper, worry over trifles, loss of will-power, indecision, hesitation. There is insomnia. *There may be tremor which is fine like that of Graves' disease.* Fibrillary twitchings of the tongue and eyelids. Tenderness and pain over the spine. The pulse in many cases is between 80 and 90. Occasionally 100-120. A fine tremor may be present. *It is hard to make the diagnosis from the milder forms of Graves' disease.* Attacks of tachycardia after excitement or mental strain. There is dyspepsia or some form of gastrointestinal disorder. There may be flatulence or diarrhea or constipation. Glénard's disease is not often found. Irritability of bladder, oxaluria is rather frequent. Weakness is most frequent in the legs. There is often tremor in the legs with a feeling of "giving way" at the knees. The patients have anxieties and fears. In older women of the poorer classes, neurasthenia is frequently associated with child-bearing, large family and insufficient means.

Gower says, "Fatigue may be produced with undue readiness by muscular exertion and by mental effort. Muscular strength is only lessened in the severer degrees of nervous weakness, but the power of sustained effort is generally reduced. Fatigue is not only sooner felt, but is often a more unpleasant sensation than the fatigue of health, and whatever pain or discomfort to which the sufferer is liable is apt to be induced. Often talking may quickly cause a feeling of weariness and cephalic sensations to which the patient is liable. Many of the sufferers habitually talk in a low voice as if every sentence involved an exertion almost beyond their strength. A sense of muscular inertia and powerlessness is very frequent, especially in the earlier part of the day when there is no real lack of strength. The effort, indeed, for any exertion may seem beyond that which is possible." (Cases VI, VII.)

Osler defines neurasthenia as "a condition of weakness or exhaustion of the nervous system giving rise to various forms of mental and bodily inefficiency." The main symptoms are, various phobias, pressure in the head, muscular weakness, often muscular helplessness, flushes of heat, especially in the head,

profuse sweating. "One scarcely sees a case of advanced neurasthenia without the existence of some form of anxiety."

Many women have "neurasthenic symptoms" without marked languor either mental or physical, without phobias and anxieties. Leaving these four conditions out of consideration, the symptoms mentioned above are those frequently mentioned as "neurasthenic symptoms."

Clarke says, "Nervous persons are perhaps best distinguished from those not so disposed by a difference in physical reaction to external agencies, by a tendency to exhibit psychical disturbances on what appear to be inadequate causes. Under 'nervousness' is also to be recognized want of resistance and incapacity for sustained effort, the too early occurrence of exhaustion after exertion either mental or physical."

Clarke says, "In dealing with hysteria and neurasthenia conditions are met with which shade gradually off from these states towards those in which the symptoms of nervousness are present, but are too vague to be classified or to be put distinctly outside the limits of physiological variation." (Case VIII.)

Gowers says, "Even among the cases of nerve disturbances which cannot be placed in any recognized category, there are some that ought not to be included in this (neurasthenia), or indeed in any other class of actual disease. Many persons possess a congenital peculiarity of nerve function for which they may seek medical advice, but which is not really morbid. Such is the persistence of the 'shyness' of early life, or a tendency, lifelong, to look on the darker side of things, or the vasomotor activity which causes so many persons, *all through the first half of their lives* to blush at the least emotion, and flush under every favorable *physical* influence."

Gowers says further, "When these, and the cases of a definite, long recognized type, are excluded, those to which the terms of 'neurasthenia' and 'neurasthenic' may be applied with convenience and without disadvantage are sufficiently numerous. In many the condition is distinctly 'constitutional'; that is the defect in the nervous system is inherent in the individual, and a similar ancestral tendency can often be traced. It dates from childhood in some; in others it comes on after puberty or in early adult life, without any discoverable cause. Of the latter a large proportion are females, who are unable to bear even the average strain of life and break down in various ways. They may be raised to a little higher level of nervous health,

but cannot be made really strong. Males sometimes suffer in the same way, but in them depressing influences can more often be traced. In both sexes the state often results from definite diseases of the nervous or general system or of other organs, which leave lasting impairment of nerve strength. Various influences, of occupation, amusement, dissipation, excess, may induce the condition; to enumerate these in detail is scarcely necessary."

It is not our purpose to discuss the well-recognized condition known as neurasthenia. The intention is simply to show the complete group of symptoms essential to a positive diagnosis, and at the same time to recall the fact that in this complete picture there are numerous "neurasthenic symptoms" which, because they are common to other conditions, should render a differential diagnosis from those conditions which are to be subsequently mentioned a matter of care and importance. These numerous indefinite "neurasthenic symptoms" are too often erroneously taken to indicate the existence of neurasthenia, when, as will be seen later, and as has been mentioned above, other conditions may be present.

Basedow's Disease.—When the typical symptoms of exophthalmos, goiter, tachycardia and tremor are present a correct diagnosis is of course readily made. This grouping of typical symptoms is by no means always present. In his work on Graves' disease Thomson calls attention to the many cases of Basedow's disease without exophthalmos and without goiter or without either. Under the twenty-eight divisions of the symptoms of Basedow's disease which are mentioned by W. H. Thomson I select the following: tachycardia, palpitation, nervousness, local weakness of the knees, weakness of the voice, depression, changes of disposition, headaches, vertigo, characteristic disorders of the stomach, characteristic disorders of the intestines, insomnia, itching, vesical irritability, all the symptoms worse in the morning, disease chronic, inward trembling. It was the purpose of Thomson "to demonstrate by the clinical histories of twenty-eight patients who at no time showed either exophthalmos or goiter, with the clinical histories of forty-two patients with fully developed exophthalmic goiter, that the former were as much cases of Graves' disease as the latter." (Cases XVI and XXII.) He says, "Moreover, the demonstration of the independence of Graves' disease or thyroid gland disease is practically important, in my opinion, on account of its facilitating

a correct diagnosis of many cases of ill-health, the true nature of which is not often suspected with a disease as definite in its pathology and, we may add, in its treatment, as diabetes melitus. These patients are rated as *hysterical* or *neuralgic* or *neurasthenic* or *rheumatic* or *dyspeptic*. But one special advantage of such a demonstration (that Graves' disease may occur without exophthalmos and without goiter) would be the recognition and proper treatment of the numerous class who have Graves' disease only in an *incipient or mild form*. Obstinate dyspeptic symptoms with headaches, neuralgias and nervousness may all be found to fall into a consistent relationship to one definite malady when once the clue is discovered by an accompanying persistent tachycardia." (Cases XVI, XVII, XVIII, XIX, XXI.) Yet even tachycardia, as Thomson shows, is not always present.

Under cases with goiter W. H. Thomson gives the following:

"Mrs. M. L. B., æt. 42. April 10, 1900. Has noticed increased indigestion, with a great deal of flatulence in her stomach, with occasional palpitation. I was at first misled, however, by not finding tachycardia. Yet she has had attacks of causeless diarrhea; weakness of the knees; inward tremor; neuralgias in the back of the shoulder and up the neck, affecting the right ear; some shaking of the right arm; tremor of the lid; and now enlargement of the right thyroid. (Case XXIII.)

"This is a case, therefore, of *Graves' disease without tachycardia*. She has been losing flesh. Her mother had double goiter, without exophthalmos."

Under cases without goiter he reports the following:

"Mrs. W. A. M., æt. 46. A case without tachycardia, but with other symptoms of Graves' disease. Gastric derangement, nervousness, headaches, pains, pains in the left ear, with tinnitus. Vesical irritability.

"Mrs. M. is a sister of Mrs. O. B., who has Graves' disease, with pronounced exophthalmos and goiter.

"March 29, 1900. Mrs. M. comes on account of much gastric flatulence, with headaches, nervousness, pains in different parts of the body, vesical irritability, and a sense of pronounced inward tremor.

"This case is interesting as the one exception in this list of *absence of tachycardia*, corresponding in this respect to Case XXIX of those with goiter. On the other hand, her sister has pronounced exophthalmic goiter and no one could doubt that both had the same disease."

A review of the symptoms minus the tachycardia shows the marked resemblance between them and the symptoms selected as "hysterical" and "neurasthenic." (Cases XXII, XXIII, XXV, XXVI, XXVII, XXVIII.)

"Functional derangement of the nervous system occurs in Graves' disease with a greater variety in the individual symptoms than in any other complaint not excepting hysteria. The nervousness has much the character of mental agitation, not unlike that accompanying a sense of fright. With some it takes the form of pure depression of spirits, worse in the morning."

MacCallum in discussing Basedow's disease, says: "Early in the disease the patients feel themselves to be irritable and excitable. The friends observe a change of disposition, very different from that observed in the development of myxedema. Instead of becoming sluggish and apathetic, with all the mental faculties dulled, these patients are occasionally susceptible to every outward stimulus, and the mental reaction is a relatively intense one. In some respects this receptive and reactive state may resemble in a mild way that seen in the maniacal stage of the maniacal depressive insanity. A feeling of *anxiety* dominates the mental state and the patient becomes a prey to groundless fears. Insomnia may be persistent, much to the exhaustion of the patient."

MacCallum speaks of "the Irish physician Graves, who described the coexistence of palpitation of the heart with enlargement of the thyroid as an affection more or less related to hysteria," etc.

A glance at the quoted symptoms of hysteria and neurasthenia must show, then, the marked resemblance existing between the selected "hysterical symptoms," and the selected "neurasthenic symptoms," and those symptoms belonging to mild or aberrant forms of Graves' disease. In speaking of the tremor and the rapid pulse which may be present in hysteria, Clarke says: "The diagnosis must be made from the irregular forms of Graves' disease." Speaking of the same condition under neurasthenia, he says: "It is hard to make the diagnosis from the milder forms of Graves' disease." It is also important to mention that at least two cases are quoted by Thomson in which, in spite of the absence of the exophthalmos and of marked goiter, and of tachycardia, he still makes the diagnosis of Basedow's disease. In observing the symptoms representing the hysterical disposition under the heading of

hysteria, in reviewing the character symptoms under the heading of neurasthenia, it can readily be seen how they resemble the excitable and nervous condition of patients suffering from Basedow's disease. *In those cases of Basedow's disease, in whom the typical symptoms are absent, it is more than probable that the diagnosis of hysteria or neurasthenia is frequently made.*

Mobius says, of Basedow's disease: "Beside the picture rich in symptoms, stand the aberrant forms in which often only some few symptoms are demonstrable, and probably the extent of these aberrant forms is *much greater than is generally supposed.*

To be continued.

EVOLUTION IN AXIS-TRACTION—AN ADVANCE
UPON THE METHOD OF UTILIZING THE PRIN-
CIPLE OF AXIS-TRACTION IN VOGUE IN
OBSTETRIC PRACTICE UNIMPROVED
SINCE ITS INTRODUCTION BY
TARNIER IN 1877.

BY

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(With two illustrations)

IN the March (1905) issue of the AMERICAN JOURNAL OF OBSTETRICS (*q.v.*) the writer described an apparatus designed to further develop the practical application, particularly in institution work, of the principle of axis-traction, and at the same time to provide for original research work along certain lines that are of great theoretic and practical interest and importance. He now wishes to report the preliminary results of practical trial based upon two high forceps deliveries in the conduct of which his improved method was personally employed.

To be sure, these two cases furnish only relative criteria for judgment, extremely limited criteria indeed, affording rather scant but fairly safe ground for honest inductive reasoning. The writer is well aware of the necessity, because of the exacting but reasonable requirements of the scientific method as applied to medicine, for supplemental work. To a conservative pitch, as

thus expressed, are keyed the writer's remarks in the following report.

So far as these two cases are concerned the results have been quite gratifying and the claims made in the original paper above alluded to apparently justified. With respect to ease of manipulation, smooth operation and facility of delivery, the writer's predictions have been borne out. The light weight (5 lbs.), portability in sections, not unattractive appearance and the simplicity of the mechanism are much in the instrument's favor besides.

Except the rods, which are made of plated brass, the instrument is constructed mainly of McAdamite, an aluminum composition about one third the weight of steel and about equal in tensile and torsional strength to "mild" steel. The traction tape is steel and the two large McAdamite castings are enameled in white; the rest of the instrument is plated.

For mechanical details the reader is again referred to the original paper, which is correct in the main, although a traction dynamometer has been substituted for the coiled and calibrated spring device, which, owing to excessive friction of bearing surfaces, proved a disappointment.

CASE I.—This case is of special interest, for the difficulties met with were by no means commonplace. (Flattened and generally contracted pelvis, large head, brow presentation, cord around neck, hydramnios, unusual weight of child.)

Mrs. M., 4-para, æt. 32, nativity Ireland. Obstetric history: Patient was delivered of her first child December 18, 1900; occipito-posterior, extremely difficult high forceps by Drs. M. L. Bodkin and J. L. Macumber; head badly damaged, child lost. Second child delivered by the author March 11, 1902; occipito-anterior, difficult high forceps, cephalic damage, child lost. Third delivery by the author February 24, 1903; occipito-anterior, arduous high forceps, child badly asphyxiated and barely saved. Author assisted in both deliveries by Dr. George Drury; Tarnier forceps employed. Perineum lacerated and restored by primary operation each time. The fourth and last delivery, in which the axis-tractor was used for the first time by the author, occurred July 20, 1905, at 11:30 P. M., in an east-side tenement house in Manhattan.

Obstetric examination two weeks before labor: Patient undersized, general health good, heart, lungs, and kidneys normal. Fetal movements not active and heart not heard. Head floating

above brim but not satisfactorily palpated, owing to hydramnios,

Lozenge of Michaelis not well enough marked to be of any import. (Posterior superior spines three inches apart.) Synostosis of coccyx. Pelvis small at outlet. Total circumference 30 inches. Intertrochanteric diameter 11 inches. Sacrum normal in size and concavity—from side to side as well as longitudinally. Height of symphysis two inches and posterior surface paralleled with long axis of sacrum high up. Old bilateral lacerations slight.

External diameters:—

Anterior interspinous.....	8 $\frac{3}{4}$ inches
Posterior interspinous.....	3 “
Intercristal	10 “
	(R.) 7 $\frac{1}{2}$ “
Ext. oblique	
	(L.) 7 $\frac{1}{2}$ “
Baudelocque	6 “

Internal diameters:—

Conjugata diagonalis.....	4 inches
Conjugata vera.....	3 $\frac{1}{2}$ “

Outlet:

Sacropubic.....	4 $\frac{1}{2}$ “
Pubococcygeal	4 “
Transverse	3 $\frac{1}{2}$ “

The patient fell in labor at full term early on July 20, but did not send for the writer until 7 P.M. Upon arrival at 9 P.M. the brow was found presenting at the brim, the exact position being left fronto-anterior. Pains strong, dilatation of cervix complete. Under ether anesthesia a left mento-anterior was finally substituted for the brow. Baudelocque's manipulations were first attempted and an occipito-posterior brought about, but semi-extension promptly recurred, whereas the mento-anterior was maintained. Unfortunately, these operations consumed some little time and chiefly account for the subsequent loss of the child. The writer was assisted by Dr. G. Morgan Muren and an intelligent woman.

Tarnier forceps applied and the axis-tractor attached. Bladder and rectum empty; full dilatation. Version or internal manual rotation considered inadmissible because of the unsafe retraction of the uterus upon the child. In addition to the contraindication of Winckel the writer confesses to a personal predilection for forceps under the circumstances. Webster considers even Baudelocque's method in brow cases in contracted pelvis difficult and risky with respect to the possibility of rupturing the uterus.

and they certainly fall short of version in seriousness. Ether was employed because it was thought that the anesthesia could be more safely prolonged if that were necessary and the operation performed more deliberately, and because it was thought that the danger of post-partum hemorrhage would be minimized, the latter being reckoned with because of the hydramnios. It is barely possible that retraction of the uterus upon the child would not have occurred in the same degree with chloroform, the latter favoring muscular relaxation more than ether.*

Delivery was accomplished in about 40 minutes with a maximum traction at the brim of 70 lbs. As the head traveled downward each successive traction became less and less. Rotation of forceps easily followed; usual mechanism of a mento-anterior throughout, the mouth, nose, forehead, vertex, and occiput appearing successively. Cord around neck tightly. Perineum intact, placenta expelled; m.xxx ergotole hypodermatically. Uterus contracted well; no shock nor hemorrhage. Subsequent convalescence of mother uneventful; ergot daily; no rise of temperature. Pelvic examination on tenth day disclosed old bilateral lacerations—slight, uterus anteфлекed; fundus at level of brim, symphysis intact and os externum admitting one finger. Examination on the fifteenth day found fundus below level of symphysis pubis.

The child, suffering from asphyxia pallida at birth, died one hour after delivery. No forceps marks discernible on head. Caput over brow.

Diameters of head:

Biparietal	4 $\frac{1}{4}$ inches
Fronto-mental	3 $\frac{3}{4}$ "
Occipito-frontal	5 $\frac{1}{4}$ "
Occipito-mental	6 "
Suboccipito-bregmatic	4 "
Bitemporal	3 $\frac{1}{2}$ "
Bimastoid	3 $\frac{1}{2}$ "
Circumference of head.....	15 "

Diameters of trunk:

Bis-acromial	6 inches
Bis-trochanteric	4 "
Length of child.....	23 "
Weight of child.....	11 lbs.

*Milne Murray holds that in contracted pelves axis-traction is as safe as version for both mother and child. Many authorities do not agree with him. Williams rules out the forceps entirely in contracted pelves. These antithetic positions represent dogmatic extremes. Each case ought to be judged on its merits and dogmatic rules avoided. Under certain circumstances version occupies a unique and unassailable place which even perfected axis-traction, as represented by the competent employment of the axis-tractor, will never menace.

Conclusions.—The condition of the child at birth seemed in no wise different from that of the first, second, and third children, all of whom suffered from asphyxia, the resuscitation of the third being barely effected.

Being a face presentation, it is possible that there were premature attempts at respiration. This may have happened as well before as after the application of the forceps. The amount of traction was well within the orthodox limit, the delivery was not unduly prolonged, there was no traumatism to the head. The intrauterine manipulation involved in converting the brow may, considering also the fact that the cord was tightly wound around the neck, have served to disturb the circulatory equilibrium of the fetus. It might be noted here that after this patient's second delivery the child did not live as long as did this last one, although it was an occipito-anterior and there were no preliminary manipulations.

It seems fair to conclude then that the loss of the child cannot be attributed to the mode of delivery, so far as the axis-tractor is concerned. It may also be justly claimed that the delivery of a mento-anterior through a contracted pelvis in forty minutes with a very reasonable amount of traction and with no maternal mishap is a rather creditable record for the instrument, tending to sustain the theoretic claims made for it

CASE II.—Mrs. A., primip., æt. 31. Delivered October 6, 1905, at St. Mary's Maternity, Brooklyn; service of Dr. P. Joseph York; house obstetrician, Dr. Francis B. Doyle. Head well engaged, dilatation complete; indication for forceps—inertia uteri. Position left occipito-anterior, obstetric conjugate normal. Delivery of a living child accomplished in thirty minutes with a maximum traction of forty-five pounds; very slight laceration of perineum. Fetal diameters and weight normal (average); no traumatism to the head. Post-partum convalescence uneventful. Cervix not lacerated.

Modus Operandi.—Having complied in a given case with the conditions laid down in the author's preliminary paper, apply the Tarnier forceps (cephalic application in the cavity, pelvic at the brim), swing the axis-tractor into the median line and connect the steel tape to the traction rods of the Tarnier instrument through the intermediate section of the latter, as shown in the cut, the dynamometer being interposed. Raise or lower the axis-tractor to the proper angle by revolving the handwheel to the left or



Jacobson's Axis-Tractor.

right (to the left raises, to the right lowers) and put on a few pounds traction by revolving the crank, until the tape is taut. See that the traction rods are parallel with the forceps handles. If the forceps handles are out of the median line align the axis-tractor, in its longitudinal axis, directly beneath them. At all points of the operation keep the rods parallel to the handles by means of the hand-wheel and also keep the axis-tractor aligned with the handles through the lateral adaptability of the instrument afforded by the universal joints which join the rods of the apparatus to the table clamp. During tractions, hold the instrument in the median line by means of the left hand grasping the hand-wheel.

All being ready, slowly put on traction, increasing it gradually until the forceps is observed to slightly advance. Traction should not be permitted to consume more than the normal duration, one or two minutes. Note the amount of traction registered by the dynamometer when the forceps begins to advance since this will be the maximum and subsequent tractions may be expected to diminish. Unless the forceps tends to advance too quickly, sustain each traction for about a minute at an optimum degree, otherwise desist sooner and use less traction the next time. Take off traction slowly and gradually. When the needle has reached zero pause for two or three minutes, or longer if thought best, during which time the fixation screw across the forceps handles should be loosened.

Repeat the foregoing, taking about twenty minutes in a primipara to bring the head down to the pelvic floor and about the same time for the perineal stage.*

If the forceps rotates a good deal detach the axis-tractor and reapply the former. As the head advances it will be found that less and less traction is needed. Two assistants must maintain the patient's position on the table and in its center. Miller's leg holders, the upper part of which goes on the patient like a vest and

*The time that one may take to effect delivery depends upon the rate of operation of the traction device and upon the degree of force applied, though an effective check upon rash employment of the latter is the fact that not more than eighty-five pounds can be pulled. There is little excuse for exceeding by three or four pounds the precise amount of traction called for in a given case, and no excuse for ten pounds. As to the rate of delivery, endeavor to imitate nature when competent, and remember that the resistance of the advancing head increases as the square of the rate of motion, and that therefore violence to the maternal soft parts depends largely upon too rapid delivery.

hence does not cut the neck or shoulders, are useful—unless Walcher's position is used.

The needle of the dynamometer, which is absolutely accurate, being true to the scale whether traveling forward or backward, will record a falling off of pounds traction when the forceps advances. The same thing will happen, though more rapidly, if the forceps is slipping. In the latter case, of course, it will also be found impossible to run up the traction.

Employ traction as far as possible only during the pains, or at regular intervals; in other words, imitate or assist nature.

It is not necessary, or even desirable, to effect an advance of the head with the first two or three tractions. By properly sus-



Dynamometer Used with Axis-Tractor.

taining a moderate amount of traction, advance will finally be effected with less power than would otherwise be required.

If the case is an occipito-posterior deal with it as indicated in the preliminary paper. If it is rotated to the front in the cavity by means of the forceps, normal rotation failing, the usual precautions must be taken to prevent injury of the maternal tissues by the tips of the instrument. When the head is not fully engaged, manual correction of this and other vicious vertex positions is, in suitable cases, sometimes feasible before application of forceps. In the case of an occipito-posterior the head is pushed cautiously up and aside, the hand passed well up, the shoulders seized and

rotation of the trunk as well as of the head effected, after which the axis-tractor may be attached.

If it is thought wise and expedient to deliver an occipito-posterior as such, carry the head through the brim with the axis-tractor and if the occiput tends to rotate anteriorly or can be "teased" around, as Marx expresses it, complete the delivery. If marked rotation occurs, detach the axis-tractor, swing to one side, reapply forceps and reattach axis-tractor; do this more than once if necessary. If the occiput fails to rotate anteriorly after the head is in the cavity detach the axis-tractor and complete delivery by Brodhead's method, except perhaps in case of those occasional multiparæ in whom a bad rupture of the perineum is possible of prevention when the occiput is delivered posterior.

Webster advises the Walcher position during the perineal stage, since it relaxes the perineum very considerably.

The fixation screw across the handles of the Tarnier forceps is not indispensable, according to Jewett and Marx. The latter states that the blades are really kept in place by the impact of the fetal head and the pelvic wall. This is contrary to the general accepted idea respecting the function of the fixation screw, as well as to the idea that Tarnier, himself, seems to have held, but these gentlemen have satisfied themselves in practice that the above statement is true. If the screw be used it is said that pressure necrosis, scarring and intracranial lesions are more likely to result, but these results are to a considerable extent chargeable to neglect to loosen it between tractions (this loosening also favors rotation, according to Webster). It certainly need not and should not be used as a compression screw.

The traction crank should be sterilized and the hand-wheel covered with sterilized gauze, these being the only parts touched. A sterilized towel may be laid over the table clamp, extending out over the upper bar and under the dynamometer and steel tape, and allowed to drop down on either side, thus covering much of the apparatus.

The instrument is merely a tractor and not a rotator. It will *follow* rotating forceps but will not inaugurate rotation. In short, it exerts no directive influence but must be made to do whatever the forceps handles do, they being the invariable guides. If the forceps has to be "teased" around in occipito-posterior cases when the axis-tractor is being used, this must be done by means of the forceps handles in the usual manner.

Traction being measured and it being impossible to exceed eighty-five pounds, the fact that the instrument almost abolishes the sense of resistance—because of the multiplication of the power applied—cannot be made a ground for adverse argument with respect to what would otherwise constitute a dangerous feature of the instrument.* One could hardly make out a favorable case for guess work as against mathematical exactness.

A little practice with the instrument, the steel tape and dynamometer being attached to a clothes-line, which is attached in turn to the legs of a table at the end opposite to which the apparatus is clamped, will enable one to become familiar with the mode of utilizing the power and otherwise operating the device.

It is probable that with it a force of fifty pounds need rarely be exceeded. Whatever the force, it is applied more gently, steadily, and precisely by this instrument of precision than was ever force emanating from an obstetrician's arms, and when any given amount of traction is sustained for a minute or two it is *sustained uniformly*. If it is fifty pounds it remains fifty pounds so long as one wishes. Anything more scientific than this cannot be expected nor achieved.

Powerful mechanical devices, *as such*, are to be condemned. It has been said of the Bossi dilator that in the apparent ease with which it works lies its greatest danger (E. P. Davis). Such arraignment of the author's instrument would be manifestly unfair, for in the registering of the amount of traction employed we have an absolutely safe, conservative, and scientific control of the situation.

The minimizing of the force employed in instrumental extraction is one of its chief claims to consideration. This materially discounts the damage factor, for it may be laid down as a general law that in proportion as the traction force used in effecting delivery by means of the forceps is reduced so is the damage factor reduced, regarding both maternal and fetal structures. The degree of compression exerted by the forceps on the fetal head is about one-half the traction force in pounds, according to Delore.

With respect to the saving of labor and the maintenance of steadiness and balance, so to speak, on the part of the operator, so that he is better enabled to conduct a delivery, one may compare the obstetrician's command over the operation of delivery by means

*The power applied is multiplied 25 times—to pull 75 pounds requires but three pounds of actual hand power at the crank.

of the axis-tractor to that which the engineer has whose throttle hand is not unsteadied when driving his locomotive by the hard and constant work of raking the fire and shoveling the coal.

Effectiveness in forceps work is largely a matter of conformity to the mechanical requirements and this postulate the axis-tractor sustains in fact as well as in theory. The writer believes that in the cases—and they are not few—in which difficulty in instrumental delivery cannot be foreseen nor afterward explained by obvious maternal or fetal conditions operating as direct factors in occasioning dystocia, that we are as much justified in referring the trouble to the obstetrician as a factor as to the passages or passenger, not in a discreditable sense, but because of the relative imperfection of our *conventional* methods and their mode of application, and the Tarnier forceps as *ordinarily* employed is included in this generalization. Making this plainer, let us picture in our imaginations a graphic representation of the aberrations of the force applied that probably occur in a high instrumental delivery in the hands of a skillful obstetrician. It is not possible for any human being, however skillful in the obstetric art, to act perfectly, accurately, and uniformly, for half an hour or more, as a source of and distributor of the force required in forceps work, be the operation high or median, even if the Tarnier forceps be the instrument employed. We *talk* about accurate traction in the pelvic axis, avoidance of misdirection of traction, and of excessive traction, as if all these things were already within the realm of mathematical-like attainment, ignoring, apparently, the fact that nothing like perfect accuracy is attainable with our conventional methods. It has been shown experimentally that manual tractions with the forceps, instead of being regular and continuous, or uniformly sustained at their maximum, are abrupt and broken at short intervals, and never uniformly sustained. (Joulin.)

Could an obstetric schema by some means be made in the course of a high delivery in skillful hands, unattended by any gross defects of the passages or passenger, with normal position, good flexion and moulding, and properly applied instruments (simply the powers being at fault), showing, as the sphygmogram shows the aberrations of abnormal arterial pulsations, similar aberrations from the supposed conformity to the pelvic axis throughout the operation, and also showing the irregular variations with respect to the power applied, what a revelation it would undoubtedly be! The Tarnier would tend to minimize the former, to be sure, but it would not alter the latter finding.

The point that the writer wishes to make is that it is probably these departures from the mechanical requirements that have much to do as factors in dystocia, assuming other adequate causes to be undiscoverable. The more nearly we can, by improving our methods, approximate a mathematical ideal in axis-traction, the more surely will we relegate the difficulties discussed, in part or in whole, from obstetric work, and the more certainly attain relatively perfect accuracy. That the latter is attainable in practice the axis-tractor may be expected to demonstrate.

In the presence of gross maternal or fetal defects in which the high forceps operation is elected as the one of choice or necessity, it seems to the writer that accuracy in the force and direction of traction becomes proportionately more imperative, and failure or success must be largely dependent upon the degree of approach to or departure from such accuracy. The probability of a successful outcome in these cases (meaning by "successful," instrumental delivery devoid of variable, excessive, or misdirected traction and consequent damage of one sort or another) must bear a direct ratio to the closeness of the approximation to the mechanical requirements, in so far as human ingenuity can conform to the severe conditions that are sometimes imposed upon us in obstetric practice. This is not only a self-evident proposition, but is supported in a way by the evidence furnished by the clinical results sometimes observed.*

Instrumental delivery is at best a poor substitute for nature when competent. Consider the 71.58 per cent. of spontaneous deliveries at Johns Hopkins in a large series of cases of contracted pelvis (the writer knows of a *precipitate* labor in a case in which Cesarean section was planned, and invitations to witness it issued),† and recall how much more efficient the forceps is when aided by the natural expulsive efforts, with anesthesia of the obstetric degree only. It is because the axis-tractor secures the closest approximation to the operation of nature, in so far as accuracy, steadiness and precision are concerned, that it permits of facile delivery with such a remarkable absence of visible traumatism with respect to the cranial vault of the child and the genital tract of the mother.

†We see this occasionally in the case of exceptionally skillful operators, like Milne Murray, who has successfully delivered with forceps cases in which the conjugate was considerably less than three inches. Webster reports safe delivery of cases in which the conjugate was three and one-quarter.

†Sixty-six and three-tenths per cent. at the Sloane Maternity.

The writer has never meant to put forth as the chief recommendation of the axis-tractor the fact that it is a labor saver. That is merely an incidental but by no means an unimportant advantage, for reasons that are perfectly obvious.* Above all other advantages must be placed the fact that with it delivery may be accomplished with a minimum amount of traction, by reason of the accurate, precise and steady application of the power, not a pound more of traction than is actually needed being used.

The fact is fully appreciated that there are men who claim to have never had any special difficulty in effecting instrumental delivery. Some of these claimants have not even found it necessary or expedient to employ axis-traction. Of such as these the writer can only say that they have been very fortunate in their obstetric practice, and that their experience suggests that of the men who have never lost their pneumonia or typhoid patients; also that of a distinguished obstetrician who makes the statement in his text-book that he has never had any marked difficulty in delivering the after-coming head after podalic version, even in the presence of a fair degree of contraction.

Although research work with the axis-tractor may at first interest obstetricians more than clinical possibilities, the writer believes that the latter will ultimately be the field of its greatest usefulness and that there is a real necessity for such an apparatus, and he does not believe that his arguments in support of the method have been too finely drawn.

Delivery by the axis-tractor will, it is believed, be found to offer the following advantages: 1. Accurate measurement of traction. 2. Perfectly steady "pull." 3. Optimum traction at any given stage of delivery capable of being uniformly sustained for a reasonable time; no variation. 4. The direction of traction is mathematically exact with respect to the pelvic axis. The axis-tractor obviates the danger incidental to traction in *any* tangent of the pelvic axis. Properly used there can be no tangential pull.†

*Cazeaux, deploring the excessive fatigue incurred by the obstetrician in difficult forceps deliveries, ascribes it chiefly to the energy expended in counterpoising one's self during traction.

†"The term axis-traction has been strangely and exclusively appropriated to the sense of an adherence to the axis in its antero-posterior curvature, ignoring the fact that precisely the same relations exist with reference to lateral deviations, and that it can make no difference whether we vary the coincidence of the axis of traction with the axis of motion and resistance by motions from side to side, or from front to back, or by rotary actions; the difference is simply in the degree to which the deviations may be carried—all equally hurtful." (Albert Smith.)

5. Traction being perfectly steady and absolutely precise, a minimum degree suffices to accomplish delivery.* This fact is emphasized as of first importance. 6. The apparatus adapts itself perfectly to rotation of the forceps. 7. Physical exertion on the part of the *accoucheur* is practically obviated; *all* forceps deliveries are divested of difficulty with respect to expenditure of physical force, an *incidental* advantage of some moment.† 8. Manipulation of the instrument is simple and easy; mechanism simple. 9. Reduction of damage factor to lowest terms; makes for greater safety and conservatism in forceps work. 10. It exerts no directive influence *of itself*, taking its cue entirely from the forceps handles as indicators of the proper line of traction; in other words, the transit of the head through the curve of Carus and its evolutions therein are directed by the walls of the birth canal. 11. Slipping of forceps fraught with absolutely no danger. 12. Owing to control of the rate of advance of the forceps, *i.e.*, if the patient is well anesthetized, the danger of bad perineal tears is greatly lessened in cases in which strong manual traction is so apt to eventuate in unexpectedly sudden advance, with consequent rupture of the perineum (*e.g.*, occipito-posteriors delivered as such). 13. In selected cases in which the pelvis is contracted its use should improve the prognosis. The writer would not attempt to define what should mark the limit of contraction, preferring to leave this important definition to others, but he suggests that this question might sometimes be made to depend more on the amount of traction tentatively employed than upon the degree of contraction, unless the latter is absolutely prohibitive. If a reasonable number of sustained, eighty-pound, one-minute tractions fail to effect progress, than we may properly conclude that some other procedure is in order. It is the writer's belief that such failure will be relatively rare in the case of the axis-tractor in comparison with manual traction under identical conditions. 14. None of the well-known advantages of the axis-traction forceps is abrogated and additional advantages are offered.

It is imperative that the conditions governing its use, as laid down in the preliminary paper, be strictly adhered to.

The procedure enables us to actually attain conditions that

*Just as the Tarnier forceps, as ordinarily used, in comparison with the classical instrument, reduces, *caeteris paribus*, the amount of pounds traction requisite to accomplish delivery, so the axis-tractor effects a still further reduction.

†It is to be borne in mind that the *prime* object of the axis-tractor is the further development of the principle and practice of axis-traction.

should be nearly ideal in institution work, or at least considerable in advance of what can be attained by ordinary methods. Of course expertness is absolutely essential. "It is not the instrument that operates," said Baudelocque, "but the hand which directs it."

We must not forever limit ourselves with respect to further development of the principle of which the Tarnier forceps has been, thus far, the only practical expression, when it is clearly within our power to attain a still higher degree of efficiency, to the end that the forceps operation shall be placed upon an absolutely scientific plane and that the means be perfected by which we make practical application of the principle the obstetric relations of which were first discerned by Hermann of Berne (although his forceps did not give proper expression to his clear enough mathematical calculations), next by Hubert of Louvain, and then by Tarnier, with his successful application.

The early exploiters of mechanical traction, working prior to Tarnier's enunciation in 1877 of the successful application in practice of the principle of axis-traction, employed it for its own sake and in no sense as a means to the end aimed at by the author of this paper. It is the combination of perfected mechanical traction with axis-traction that realizes the theoretic and at the same time the clinical ideal. Mechanical traction has no place in conjunction with the ordinary forceps. Properly applied, its scientific features are satisfactory. Its improper application in the past explains the desuetude into which it has undeservedly fallen and the failure to apply it, perfected, to axis-traction, explains the imperfection of the latter as heretofore employed.

Chassagny (1860) was the father of mechanical traction. Pros and Joulin made subsequent attempts. Finally Tarnier and lastly Pouillet made additional efforts in this direction. All their devices were long since abandoned.

In the treatise of Tarnier and Budin (1901) the question of mechanical traction is considered still an open one. Singularly enough, Tarnier, although this was a subject that interested him greatly and one with which he experimented at some length, does not appear, so far as the writer can ascertain, to have attempted to apply the principle of mechanical traction in connection with his axis-traction forceps. He used the ordinary forceps in his experiments. Had he utilized the former in a perfected form he would have satisfied the two principles upon the proper application of which he himself conditioned success, to wit: 1. The

traction must not be applied to the handles or shanks of the forceps. 2. The traction must at all times be exerted in that line which the principle of axis-traction recognizes as the only correct one.

It is altogether probable that such an idea must have occurred to him, for he fully recognized the desirability of satisfactory mechanical traction and had himself solved the problem of how to properly direct traction in the pelvic axis. If so, his difficulty may have consisted in devising the requisite apparatus. The writer can thoroughly appreciate this, for it has taken the best efforts of an expert in mechanics (Mr. Clifton W. Wilder) to work out, in three years, an apparatus that satisfies the requirements, and this in a period characterized by a highly advanced state of the two fields of science jointly involved.

A word as to the relation of the author's apparatus to the mechanical traction devices that have preceded it. He admits two relations—his apparatus is a mechanical device and one of its functions is mechanical traction. The fundamental idea of the author's device is, however, not mechanical traction *per se*,* the latter being merely utilized as a means of attaining an end, viz., perfect axis-traction. By no other means could the latter desideratum have been attained. Incidentally, and necessarily, there has been an evolution in the method of providing the mechanical traction. Therefore, as to priority, the author admits none other than that essentially involved, to wit, axis-traction, of which principle his device is a development in practical application; *modus operandi*, mechanics, aim and scope, effectually distinguish the axis-tractor from what may be termed obstetric junk.

The failure of the distinguished obstetricians alluded to to satisfy the exacting requirements with their crude and curious arrangements of ropes, straps, cords, and chains have led *accoucheurs* to think of mechanical traction as impracticable and unattainable and they have expended their energies of late in other ways. Failure has also bred prejudice against the principle itself. The great mind of Tarnier, however, perceived the inherent soundness of the principle, even after his own deplorable experience (four dead infants and two mothers out of seven cases), and he believed that in the future all objections against

*The devices of Chassagny and his disciples may be regarded in the light of primitive efforts toward what has constituted but a subordinate and incidental phase of the author's program.

*mechanical traction would be overcome, and that, perfected, it was destined to prove of great value in a clinical way.**

The writer understands that in America at least two attempts have been made in the direction of mechanical traction, the late John Byrne being sponsor for one, and a living obstetrician of note for the other. Their utter failure explains the absence from the literature of any account of their methods and experiences.

Tarnier declared that manual traction was bound to vary according to the muscular force of different individuals and their ability to apply it, and in mechanical traction, could it be properly applied, he saw great advantages. Guéniot and Pajot also shared in the belief that the latter was capable of being perfected. Bailly, Charpentier, Depaul, and Pajot condemned all the apparatus used by their colleagues.

The various objections that have hitherto been urged against mechanical traction are all invalidated by the author's apparatus. They are as follows: 1. Blind force substituted for the sentient guiding hand. 2. Traction invariable and progressive—continuous. 3. Slipping during traction fraught with danger. 4. Interference with lateral movements of the forceps (rotation). 5. Likelihood of force being applied obliquely to pelvic walls, resulting in loss of direct force and probable maternal damage. 6. Greater liability of damage to the fetal head because of the foregoing objections. 7. Too much time consumed in manipulation. Barnes condemned mechanical traction on the ground that it obviated the use of the forceps as a lateral lever. Of course, to the present-day obstetricians this quality would be regarded as anything but an objection. It was also said that manual traction was capable of accomplishing the same thing, *i.e.* delivery of the child, even through a contracted pelvis, if delivery were at all possible.

Our attempts at instrumental aid should be based upon the idea of applying extractive force as early as possible as nature applies expulsive force during pains—steadily, rising gradually to an efficient maximum, then sustained for a short time, falling again without abruptness, then an intermission, the force at all times being directed so as to effect the transit of the head to the best mechanical advantage: that is to say, exactly in the curvilinear axis of the birth canal; and particularly should we strive to attain the desired result in a given case with an amount of traction no

*Charpentier.

greater than nature herself would probably have utilized had she been competent.

"Perfected" mechanical traction may have certain disadvantages, as probably no one will deny manual traction also has. The practical question is, does the sum of the advantages of the former, when used in conjunction with the axis-traction *forceps*, exceed the sum of the advantages of the latter?

There is a field for research work with the axis-tractor which should yield valuable results. The writer is disposed to place but little reliance upon such data as we have with respect to the force expended by nature or artificially in effecting delivery. The methods which have been hitherto utilized in formulating conclusions have been open to errors and fallacies of various sorts. Their devisers deserve great commendation for their painstaking and ingenious attempts, and it is true that they have not been entirely profitless in their influence upon conservatism in forceps work. The results of Schatz are given as from 17 to 55 lbs., and Williams regards his method as "rather accurate." A rubber bag in the uterus is connected with a manometer. The intra-uterine pressure in the intervals between contractions is found to average about 20 millimeters (height of mercury column), 5 due to tonicity of uterine walls and 15 to the contents. During pains the column rises to 80-250 millimeters—corresponding to a force of $8\frac{1}{2}$ - $27\frac{1}{2}$ lbs. (to this must be added the voluntary forces). The force increases markedly when the fetus is partially expelled from the uterus.

The various methods of measuring the force exerted in labor are as follows:

I. The method of Schatz, described above (tocodynamometer).

II. Measuring the bulk and extent of the voluntary and involuntary muscles concerned in the function (Haughton).

III. By determining the force necessary to rupture the fetal membranes (Poppel, Duncan, Ribemont).

IV. By the tocograph (Poulet).

V. By measuring the force required to hold the head back at the vulva.

VI. By forceps fixed upon a Salter's spiral balance used as a dynamometer. (Simpson.)

VII. By the use of various types of dynamometers attached to forceps.

Duncan's maximum estimate was 80 lbs. (including the abdominal muscles); average about 50 lbs. Haughton (quoted by Playfair) estimates the *uterine* forces as about 54 lbs. ordinarily and attributes most power to the abdominal muscles. Joulin attributes a maximum power of 100 lbs. to the uterine contractions alone, but states that it rarely exceeds 80 lbs. He minimizes the importance of the abdominal muscles as factors, thus differing from Haughton. Williams states that more than 50 lbs. is seldom required to hold the head back at the vulva. Simpson's method showed that from 25 to 50 lbs. were required to deliver. Delore and Tarnier state that 132 lbs. may be called for, and they fix this as a safe maximum for tractive force, on the ground that the degree of compression, which they say constitutes the chief damage factor, is equal to about half the tractive force, and that experiments have shown the fetal head to be capable of withstanding compression equal to about 65 lbs. Williams appears to regard about 100 lbs. as the limit, since it has been shown that 120 lbs. is sufficient to tear the child's head from the body. 100 lbs. is certainly the greatest limit that we should ever reach, for various reasons other than Williams's; for, analyzed, his reasoning is not sound. The child's shoulders and body in parturition tend to follow the head, whereas in such laboratory experiments as the above they are made to effectually resist traction on the neck and head.

Aside from the inherent defects of the methods pursued by these investigators, the above results show a suspicious disparity. The data furnished by the author's apparatus would not be open to criticism upon any grounds referable to purely mechanical defects, for the last degree of precision would obtain and resulting records would stand by themselves as the first really accurate ones, *i.e.*, if the assumption is sound that, other things being equal, *vis à fronte*, accurately directed (mechanical axis-traction) and barely sufficient to slowly effect delivery, is approximately equivalent, in terms of pounds, to *vis à tergo*.

The writer has striven to avoid overstatement and has endeavored to bear in mind one's liability to minimize the disadvantages of one's own projects; or, on the other hand, fail to see them at all. He has, perhaps, fallen into all of these errors, but if such be the case his self-satisfaction will be short-lived, for in the crucible of obstetric trial and criticism the gold and the dross are sure to be ultimately dissociated. Finally, if his paper

reveals to experts defective knowledge of the principles of obstetric science, or imperfect acquaintance with the technics of obstetric art, he can only plead in extenuation the fact that he is a general practitioner whose opportunities and incentives have in no wise been comparable to those of men with adequate institutional facilities.

In conclusion, the author's acknowledgments for kindly encouragement are due to many obstetricians, notably Drs. George L. Brodhead, William S. Stone, Charles Jewett, Robert L. Dickinson, and John O. Polak, of New York City, J. Clarence Webster, of Chicago, and Barton Cooke Hirst, of Philadelphia. His chief indebtedness is to Mr. Clifton W. Wilder, M. E. (Mass. Inst. Tech.), without whose cooperation the writer would have accomplished nothing, for his work was characterized by a genuine scientific interest as exceptional as it was invaluable, and as painstaking as it was expert. Further acknowledgments are due to Drs. Muren, York, and Doyle.

115 JOHNSON STREET.

PSEUDOMYXOMA PERITONEI.*

BY

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(With plate and illustration.)

SINCE the appearance of Werth's paper in 1884, this disease has received much attention in Germany, and the German bibliography is extensive; but the references to it in English literature are scanty. Only three separate articles could be found in English in the last twenty-five years. It is evident that the experience of surgeons in England and America with the condition must have been limited, or else if encountered it has not been generally understood.

Prior to Werth's study, gelatinous or myxomatous peritonitis was recognized in France and Germany, but it was thought that the peritoneum itself had undergone a degeneration with the overproduction of gelatinous or mucoid tissue. Even Virchow entertained this view. Werth was the

*Read before the Gynecological Section of the College of Physicians of Philadelphia, October 19, 1905.

first to demonstrate that these cases were the result of a ruptured pseudomucin glandular ovarian cyst with evacuation of pseudomucin into the peritoneal cavity. A plastic peritonitis ensues with the formation of fibrous trabeculae running through the gelatinous mass and the peritoneal surfaces assume a curious gray color from the organization of lymph over them. The pseudomucin being too thick and tenacious to be absorbed by the blood vessels and lymphatics, even though much diluted, remains as a foreign body in the abdominal cavity and excites a peritonitis by irritation. Werth, as is well known, gave the name pseudomyxoma peritonei to this condition.

In the early cases, as the origin of the disease was not understood, the presence of an ovarian cyst and of a rupture in its wall were not always reported because they were not looked for. Subsequently the ruptured cyst was always discovered. The perforation in the cyst wall is usually round with thickened edges, and is explained by a localized extravasation of blood with consequent necrosis. Occasionally the rupture is traumatic. The perforation may close again by formation of membrane over it, or by a cicatrix, but its situation may be detected by a careful examination.

The same year that Werth's paper appeared, Baumgarten pointed out the possibility of implantation metastasis in the peritoneal cavity or on its walls, by the transference of proliferating gland tubules from the ovarian cyst to any situation where they could imbed themselves, receive nutrition, and display continuous growth and proliferation. In 1885, Olshausen reported his first case of metastatic growth. For the past twenty years numerous cases of implantation metastases have been reported in the omentum, the intestinal walls, the parietal peritoneum, the abdominal wound after section and in the appendix. Masses of pseudomucin weighing forty pounds have been removed from the peritoneal cavity, repeated operations have been required, sometimes years apart, and the mortality of these secondary growths is high. Werth quotes one case which recovered as a proof that the disease is not invariably fatal. According to Strassman only five out of thirty-six cases showed an uncomplicated recovery, and Günzburger in forty cases found 44 per cent. recovered.

Finally, it appears from the studies of E. Fraenkel that we must occasionally differentiate pseudomyxoma peritonei, from two other conditions which might possibly be mistaken for it. In one

of Fraenkel's cases there was a histological change of the peritoneum suggesting myxomatous degeneration, so that there may have been some justification for the terms "gelatinous and myxomatous peritonitis" of the older pathologists, including Virchow; and in another of Fraenkel's cases masses of jelly-like mucus were found in the pelvis of a man, derived from a ruptured cystic appendix. I understand that Dr. LeConte has recently had a similar case in the Pennsylvania Hospital, and the accompanying illustration of a cystic appendix associated with carcinoma of the ovaries and containing in its walls carcinomatous nodules, which I removed a few months ago, shows how the appendiceal mucous membrane might be the source of considerable quantities of mucus in the peritoneal cavity.



A typical case of pseudomyxoma peritonei on which I operated in the Howard Hospital last spring, suggested this brief study of the literature and exhibited some unusual features which are worth recording.

The patient was an unmarried nulliparous woman fifty years of age. She was sent to me by Dr. Charles J. Hoban, for the operative treatment of a complete inversion of the vagina and a prolapse of the uterus. There was some suspicion of an abdominal tumor, but the patient's history as well as her physical signs were indefinite. She had noticed some abdominal enlargement about six months before at the time when the prolapse of the uterus occurred and there had been some abdominal pain, but she was quite stout so that abdominal palpation was

unsatisfactory. Both Dr. Hoban and I thought we could make out a tumor on the left side, but we were not sure. As it was intended to open the abdomen in any case to suspend the uterus for prolapse it was decided to explore the cavity after section in order to make a positive diagnosis. The customary plastic operation for complete prolapsus uteri was performed and the abdomen was opened. Some fifteen pounds of pseudomucin was found free in the abdominal cavity, there was a semi-collapsed ovarian cyst on the left side with an opening on its posterior superior surface. The peritoneal surfaces everywhere had the curious dull gray color characteristic of these cases, and long fibrillæ of organized lymph extended in all directions through the abdominal cavity. Two typical daughter cysts, the size of a cherry, were found in the wall of the ileum, one exhibiting a spontaneous perforation of its wall, through which clear pseudomucin was oozing. The collapsed tumor, the free pseudomucin and the daughter cysts were removed, the uterus was suspended and the abdomen closed. At the present time, six months after the operation, the patient is in perfect condition, but it is much too soon to assert that she is permanently well. Secondary operations have been required fourteen years after the first, and three successive abdominal sections have been performed in as many years on a patient with recurrent growths. On the other hand, even though small daughter cysts were left behind, a permanent recovery has been secured. The present excellent condition of my patient encourages me to hope that her cure is permanent.

The most curious feature of my case was the complete inversion of a nullipara's vagina and the enormous distention of the pouch thus formed, evidently by the weight of the free pseudomucin in the pelvic cavity. One might expect that this result would be frequently noted, but in the literature that I have had the opportunity to examine there was not a similar case. The interior of the glandular ovarian cyst also presents a peculiar appearance. Instead of having the usual divisions into numerous chambers there is one large cavity to the inner wall of which numerous grape-like daughter cysts are attached. The microscopic examination of the tumor walls and of the daughter cysts showed the typical histology of a pseudomucin glandular cyst.

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1821 SPRUCE STREET.

APPENDICITIS COMPLICATING PREGNANCY AND PARTURITION.

BY

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THE following cases in the experience of the writer are selected as typical of various phases of the subject under discussion.

CASE I.—Primipara, four months advanced. Seen in consultation with Dr. W. H. Wells. The patient was passing through a typical attack of acute appendicitis, with moderate

fever and pain, slight tenderness and rigidity of the abdominal wall. The symptoms not subsiding with rest in bed and medication, she was brought to the Jefferson Maternity and subjected to operation. On opening the abdomen there were no adhesions; the appendix was enlarged, its base constricted and it was readily removed. On opening the appendix, its lining membrane was turgescient and it contained mucopus. The patient's recovery was complicated by skin infection of the wound, which readily subsided on treatment. Her ultimate recovery was good. Pregnancy was uninterrupted, and no symptoms of threatened abortion occurred.

CASE II.—Age twenty-three. Multipara. Was sent to me at the Jefferson Maternity by Dr. W. B. Jameson. She had borne two children at term. The first delivery was by forceps, the second normal. A month before admission to the Maternity, she had pain in the lower abdomen, with a discharge of fluid from the vagina and had vomited several times. Pain was referred to the right side of the lower abdomen, and had been severe at times. Ectopic gestation was suspected by her attending physician.

On examination, the uterus was enlarged and movable; but on the right side of the uterus, in the pelvis, there was an area of tenderness and resistance; the mobility of the uterus was somewhat lessened.

The patient was subjected to operation, because it was recognized that while the pregnancy seemed to be intrauterine, there was a focus of infection in the pelvis of unknown character, which threatened to interrupt pregnancy and endanger the patient. On opening the abdomen, the uterus and its appendages were normal; pregnancy intrauterine of four months duration. The appendix was adherent to the colon, twisted upon it and bound down by a strong band of adhesion. This, through its peritoneal connections limited distinctly the mobility of the uterus. Adhesions were ligated and severed; the appendix was removed, with its stump inverted and covered with peritoneal surface.

The abdomen was closed without drainage.

The appendix was enlarged and the site of acute catarrhal inflammation with necrosis of the mucous membrane and thrombosis of many of the blood vessels. Microscopic examination of the tissue showed that it was infected.

The patient had no signs or symptoms of abortion after the

operation. The uterus rose in the abdomen with remarkable rapidity, and the skin edges of the wound at one point separated slightly. The wound healed perfectly without infection, and the patient went home in good condition. Her physician writes that she remained well, and that her confinement was normal.

CASE III.—Primipara. During pregnancy had several attacks of pain in the right side of the abdomen, radiating upward and toward the gall-bladder. There was never fever nor abdominal rigidity, and a diagnosis of appendicitis could not be made. She was delivered with forceps and when well enough to go about had a return of the pain for a few days. She was well for some time afterwards, when a second pregnancy occurred, and during this she was without pain or disturbance and in good general health. After recovery from spontaneous labor, attacks of pain again occurred, referred to the right lower portion of the abdomen, the pain being cramp-like or colicky, and often aggravated by motion.

Abdominal section was performed by Dr. Edward Martin and the appendix removed. It was the site of simple chronic catarrhal appendicitis. It was adherent to the ovary, with adhesions indicating positively the previous existence of a local peritonitis. The patient made a rapid recovery.

This group of cases illustrate appendicitis of an acute and chronic nature, occurring during pregnancy, and the good results following removal of the diseased tissue. Had operation been done in Case III during the first pregnancy, the patient would have been spared the danger and suffering which ultimately led to the removal of the appendix. It was especially interesting to note in Case II, the rapid enlargement of the uterus, whose growth had been hindered by the broad band of adhesions. In these patients the relief from pain was instantaneous, improvement in general health most marked.

CASE IV.—Primipara. Had suffered for years with constipation, and complained of pain in the right lower portion of the abdomen. Neither fever nor rigidity could be detected, nor could the site of pain be precisely located. The patient was chronically constipated, and under treatment addressed to this the pain grew much less, and as the uterus rose in the abdomen, her condition improved. The uterus did not enlarge symmetrically, and when labor came on a transverse position occurred, with shoulder presentation. The child was a large male and was delivered with difficulty. It breathed feebly

and did not survive. The mother made an uninterrupted recovery. This patient has since had two children and one miscarriage without complications. While in this case the appendix cannot be proved to have been at fault, in the absence of abdominal section, it seems most natural to ascribe the symptoms present to disease of the appendix and surrounding tissues which interfered with the normal development of the uterus in the first pregnancy and at least indirectly was a factor in bringing about a complication in labor. This patient has had constipation for many years, and has, at times, intestinal catarrh.

CASE V.—Primipara who, some time before her pregnancy, had been operated upon for appendicitis. At operation, the condition found had been serious, with many adhesions, and difficulty was experienced in removing the appendix. Convalescence from operation was very slow, a sinus remaining through which a ligature was finally discharged. The wound finally closed, leaving a firm scar.

During pregnancy on two occasions, the patient was taken with severe pain, referred to the stump of the appendix, followed by uterine contractions so vigorous that the interruption of pregnancy was threatened. Rest in bed and opium were required for a week or ten days, until the patient felt better. Gestation was prolonged for nearly three hundred days, and labor with breech presentation was terminated by manual extraction. The patient was found to have multiple fibromata of the uterus. Although the scar from the appendix operation was of considerable length, it did not become stretched during pregnancy or labor, and no hernia occurred. This patient made an uninterrupted recovery.

Case IV illustrates the effect upon the development of the uterus during pregnancy produced by adhesions at the side of the uterus. While in the absence of operation we cannot positively assert that the appendix was at fault, the character of the pain and the condition of the uterus during pregnancy left no doubt regarding the existence of adhesions in the right lower portion of the abdomen. It is but fair to regard the source of the adhesions as undoubtedly disease of the appendix.

Case V illustrates the complications, which the adhesions forming during appendicitis may cause in pregnancy. The fact that this patient went to full term is remarkable, in view of the rigidity and severe attacks of pain, caused by the separ-

ation or stretching of adhesions. The contractility of the uterus and its development were both interfered with by adhesions resulting from appendicitis.

The writer has attended several women in labor who had previously been operated upon for appendicitis. In none of these cases has the scar given away, and in none of them did hernia develop.

CASE VI.—From the wards of the Philadelphia Hospital. Patient about three months advanced in her second pregnancy. Complained of almost constant pain in right lower portion of abdomen. Denied pregnancy, but vaginal examination revealed the fact. It was, however, impossible to decide definitely between pyosalpinx on the right side and appendicitis; accordingly, abdominal section was performed and adherent appendix found and removed. The uterus was pregnant three months; the right tube and ovary normal; the left tube and ovary had been removed at some previous operation. The patient's relief from pain was immediate and complete—her convalescence uninterrupted.

The limits of time and space prevent a complete review of the literature of this subject. Among recent papers, we call attention to that of Futh (*Zentralblatt für Gynäkologie*, No. 7, 1905) read before the Obstetrical Society of Leipsic. He calls attention to the fact that in early pregnancy the uterus fills the pelvis, and hence pus forming from a ruptured appendix would not work its way downward into Douglass's cul-de-sac as readily as later in pregnancy. In the puerperal period the uterus again fills the pelvis during the early weeks of involution. Zweifel confirms the observation that in appendicitis complicating early pregnancy and the puerperal period, pain is apt to be referred to the region of the liver, and even of the left side of the abdomen, rather than to the affected region. Fellner (*Zentralblatt für Gynäkologie*, No. 18, 1905), in a paper upon "Surgical Operations During Pregnancy" strongly urges operation for appendicitis, and states that the number of cases in which pregnancy is interrupted following operation is 35 per cent., and the number of cases in which pregnancy is interrupted without operation is 44 per cent. At the last meeting of the American Gynecological Society, May, 1905, Coe contributed a paper upon the subject, reporting typical cases, many of whom came to operation *Surgery, Gynecology and Obstetrics*, July, 1905). Webster, in the same journal, con-

tributes a paper in which he urges the expediency of operation for appendicitis during pregnancy. In the *AMERICAN JOURNAL OF OBSTETRICS* for August, 1905, Baker and Lapthorn Smith write in the same strain reporting cases, while Robb contributes a paper showing that in a series of operations upon the pelvic organs, the appendix was found inflamed in 13.46 per cent. In 370 operations there were four deaths, and none of these could be traced to the removal of the appendix. Many of these women must have passed through pregnancy. In one case ectopic gestation was present, with hypertrophy of the appendix. This is readily understood when we remember that in right-sided ectopic gestation fetal tissue forms upon the appendix and tissues adjacent to the gestation sac. At the same meeting of the American Gynecological Society, and published in the same journal as the foregoing paper, Peterson contributes a paper showing the frequency of disease of the appendix in all affections of the pelvic viscera in women. When we consider that a great proportion of pelvic disease in women originates in pregnancy, the significance of the observations of Robb and Peterson in connection with this subject become apparent. In a paper entitled, the "Prospects and Vicissitudes of Appendicitis after Operation," Treves (*British Medical Journal*, March 4, 1905) draws attention to the impossibility of distinguishing clinically between chronic appendicitis and chronic ovaritis. This draws our attention to the fact that during pregnancy, pain and irritation in the right side of the abdomen may be ascribed to the right ovary, when in reality the disease present is in the appendix. Among the 1,000 cases of operation quoted by Treves were six cases of pregnant women; three of these had general peritonitis, two were six months pregnant, and one was four months pregnant. All of these patients aborted and all died. Three cases had abscesses originating in the appendix and complicating pregnancy, two at six months and one four months. Two of these aborted but recovered, while in the third case, pregnancy was undisturbed. In Treves' cases of those pregnant, but who had pelvic peritonitis following, six aborted and died. The further pregnancy was advanced the greater was the danger of abortion after operation. The earlier operation was performed in pregnancy, the better for the patient.

Heaton (*British Medical Journal*, March 4, 1905) describes the peculiarities of appendicitis in women, and especially during

pregnancy. Mild attacks in the early months of pregnancy may subside and pregnancy go on. If suppuration occurs, danger is enormously increased in the later months of pregnancy; pus forms and pregnancy is almost invariably interrupted independently of operation. The emptying of the uterus greatly increases the risk of general peritonitis, through its disturbance of the lymphatic abdominal condition, and the dissemination of pus throughout the abdomen. In mild cases of appendicitis the patient may pass through pregnancy, and inflammation apparently subsides; but after labor or miscarriage, pelvic inflammation of the right side may develop; this frequently goes on to suppuration. It is impossible to tell in these cases without operation, whether the Fallopian tube or the appendix is the cause of the trouble.

Appendicitis may happen at any time during pregnancy, and may be primary or secondary. In mild cases the vomiting which accompanies the attack may be mistaken for the vomiting of pregnancy. Appendicitis during pregnancy runs a rapid course, and suppuration in a majority of cases will develop. Where pus is formed it should be evacuated at the earliest possible moment. The operator must remember that in these cases the uterus and the Fallopian tube usually form one of the walls of the abscess. In evacuating pus, tissues should be disturbed as little as possible to avoid abortion or premature labor, and to prevent pus from becoming disseminated throughout the abdomen. The occurrence of premature labor is unfortunate in these cases, and always adds greatly to the gravity of the situation. Heaton collected twenty-four cases, including four of his own. In six, suppuration did not occur, and these recovered without operation, although in several pregnancy was interrupted. Eighteen cases had suppuration, and of these nine recovered and nine died; a mortality of 50 per cent. In 78 per cent. of cases abortion or premature labor occurred after the formation of pus. Ballance (*British Medical Journal*, July 15, 1905) contributes a paper upon appendicitis in which he urges immediate operation in all cases. His views are based upon his experience in St. Thomas' Hospital, and he compares the published cases of Neuhaus at the Charity Hospital, Berlin; Jalaguier and Kirmisson and Schwartz of Paris, and Sonnenberg of Berlin.

It is true that the cases reported in this paper were not those in which suppuration occurred; but these cases emphasize

two points: the good result of operation in early pregnancy in appendicitis, and the fact that where a severe appendicitis has occurred, whether during pregnancy or when the patient was not pregnant, it is an important complication in the pregnant condition. Since this paper was begun, another patient, eight months pregnant, has come under observation, from whom the appendix was removed some two years ago, and who now during pregnancy, is suffering considerable pain through the traction made by the growing uterus upon adhesions.

The purpose of this paper is to call attention to the fact that appendicitis is a serious complication of pregnancy, and that adhesions following appendicitis may bring discomfort and danger to a patient who becomes pregnant after she has recovered from disease of the appendix. We also urge for consideration the proposition that in view of the serious consequences which follow appendicitis in pregnant women, the appendix be removed in pregnant women as soon as inflammation attacking that organ can be diagnosticated; remembering the impossibility of differentiating between inflammation of the right Fallopian tube and ovary, and inflammation of the appendix complicating pregnancy, operation should be done without waiting to make a positive diagnosis that the tube is inflamed and the appendix not affected, or that the contrary is the case.

APPENDICITIS COMPLICATING PREGNANCY.

BY

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ELEVEN years have elapsed since Mundé reported the first operative case of appendicitis complicating pregnancy. Since this time the number of reported cases has increased but not in proportion to our statistics concerning the appendix and other complicating conditions. This is all the more remarkable, when the recent and abundant work on the relation of the appendix to the pelvic viscera in the female is noted.

Kelly, in a series of 115 abdominal sections on females, found a

normal appendix in only 64 cases, there being adhesions to the right ovary and tube in 10 cases and general adhesions in 37. Ochsner, in 248 cases found the appendix and one or both tubes involved 56 times. Deaver, in a series of 500 cases of acute appendicitis, found 170 in women. Abundant literature might be quoted to show that the frequency of appendicitis in the female, its not infrequent complication with the genital tract and the occurrence chiefly during the menstrual life, would warrant our anticipating it as a complication of pregnancy far more often than our present statistics permit us to infer.

I have been able to collect from the literature 143 cases of appendicitis during pregnancy, labor, and the puerperium; a number sufficient to warrant our drawing certain conclusions.

The etiology of appendicitis is the same during pregnancy as at any other time, and no conditions have been observed which influence the development of appendicitis during gestation.

Constipation, which is generally considered an etiological factor, is exaggerated as a rule in pregnancy, but not to such a degree as to make it of great importance. An increased congestion does undoubtedly exist in the pelvic and abdominal viscera, but the effect which this would have will depend entirely upon the condition of the appendix before pregnancy. Labhardt goes too far when he attempts to explain the infrequency of appendicitis by the existence of this congestion, which, according to him, relieves the chronic inflammation. The normal appendix will not react; quite different, however, is the case in the presence of a chronic recurrent appendicitis. We may safely say that there is no predisposition to the development of an appendicitis during pregnancy, but where it has previously existed there is a great tendency to its recurrence and to the development of a more grave course. Fellner claims that in a review of 38,000 cases a return of appendicitis during pregnancy was observed in all cases where it had previously existed, with one exception.

In 51 per cent. of the total cases, the complication of abscess existed. Ochsner, in 1,000 cases of appendicitis, found this complication in 15 per cent. The difference is to be explained in two ways: first, the fact that an appendicitis during pregnancy is more severe; and, second, that only the grave cases are diagnosed and reported, the simple catarrhal form being entirely overlooked or diagnosed as some other condition, thus making the percentage much larger. The histories of the reported cases are not sufficiently accurate to determine the exact percentage of those cases

of abscesses, which were preceded by previous attacks of a simple catarrhal appendicitis, but there can be no doubt that it is large. If, according to Deaver, 8 per cent. of the cases of involvement of the right adnexa are due to appendicitis, and almost all cases recur during pregnancy, either appendicitis causes sterility—a condition which cannot be proven—or it is not diagnosed.

The anatomical relation between the appendix and the genital tract is in some cases an important factor. The ligament of Clado serves as a direct lymphatic connection between the right ovary and the appendix, as the case which I shall report will show. This does not, however, play any special part in cases of pregnancy, unless the stretching of the ligament with the growth of the uterus may tend to spread the infection from the appendix to the ovary, and *vice versa*.

Another factor is the change of the position of the cecum and appendix during the growth of the pregnant uterus. The literature on this point is very meager. Füh recently, in the Leipzig society, demonstrated plaster models of the abdominal viscera from the third to the ninth month of pregnancy, and these show that with the growth of the uterus, the cecum and appendix are gradually lifted out of their normal position to several fingers breadth below the liver. Waldeyer also mentions the fact that with the growth of the uterus the cecum is lifted and shows several drawings with slight elevation at six months. The anatomical fixation would seem to exclude any great excursion, excluding anomalies when a mesentery exists. This point could readily be determined where so many opportunities for observation are offered in Cesarean section.

Clinically, the tendency to the upward growth of an appendiceal abscess toward the liver might partially be explained by this change of position, but the filling of the pelvic canal by the uterus must not be disregarded.

In order to deal with these cases in a way that would give true and reliable statistics, I have divided them into three classes. First, those cases complicating pregnancy and labor, but not operated—of these there are 52; second, those cases complicating pregnancy and labor—operated—69 cases; and third, those cases occurring post-partum, both operative and non-operative, of which there are 22.

Of the 52 cases occurring during pregnancy and not operated, 43, or 82 per cent., were the simple catarrhal form; 9, or 18 per cent. developed abscesses, 6 of whom died and 3 recovered by a

rupture of the abscess into a neighboring viscus. Only one case of the catarrhal form died, and the cause of death is not noted. There were 6 abortions and 7 premature labors, making an interference with the normal course of pregnancy in 25 per cent., with a loss of the products of gestation in 20 per cent. Boijee reports 33 non-operative cases with an interruption of pregnancy in 54.5 per cent.; the pathological condition present was not noted. The mortality in the total 52 cases was 14 per cent., as compared with a mortality of 24 per cent. in 25 cases reported by Boijee and 15 per cent. in 15 cases collected by Pinard.

Of the 69 cases operated during pregnancy, a gangrenous appendix or abscess was noted in 49 cases, or 71 per cent. Heaton reports 24 cases with an abscess in 18, or 75 per cent. The catarrhal form was in only 17, or 25 per cent., while in 3 cases there was no report. The attack was observed 46 times, or 58 per cent. before the fifth month of pregnancy, 17 times, or 25 per cent., after the fifth month, while in 12 cases, or 17 per cent., no mention of time was made. This seems to indicate that factors other than mere mechanical irritation from the large uterus exist.

Much has been written of abortion and miscarriage as a result of operations, but the following figures will clearly show that the interference with pregnancy is not due to the operation, but is the result of the appendiceal condition itself. There are 17 operated cases of chronic catarrhal appendicitis reported, and in no case did it interfere with the normal course of gestation; while in contrast to this, there were 26 cases of abortion, or 37 per cent., following operations for abscesses and in 11 cases or 16 per cent. abortion occurred before operation. (This includes two cases delivered before foration has occurred or an abscess has formed, we cannot expect to have satisfactory results either for the mother or child, for we find that 57 per cent. of all such cases will abort, regardless of our interference, sacrificing 32 per cent. of the mothers and 60 per cent. of the children. Pinard reports 30 cases with a mortality of 33 per cent. Boijee collected 31 cases of acute appendicitis operated, with a mortality of 41 per cent. and an interruption of pregnancy in 58 per cent. Vinay, in 52 cases of all kinds, reports abortion in 40 per cent.

We need only compare our 66 2-3 per cent. mortality in conservative treatment with the 32 per cent. radical treatment to determine the best method of procedure where pregnancy is complicated with an appendiceal abscess.

The disturbance in gestation is not due to the opera-

tive interference, hence it must be explained in other ways. When an abscess has developed—and these are the cases in which abortion usually occurs—there are a number of conditions which might produce this result. The shock attending the perforation of the appendix must play a great part, and this, followed by the peritonitis, would readily explain many cases. Those cases in which a long, continuous fever has existed respond in the same way as do the cases of acute infectious diseases. Vinay thinks the abortion is due not so much to the infection as to the anatomical relation.

The presence of the abscess itself acts as a constant irritant, especially in those cases in which the uterus forms a part of the abscess wall. The adhesions caused by the abscess sometimes interfere with the growth of the uterus, causing an abortion. Pinard refers to this, and Koenig reports such a case.

The course of an appendiceal abscess during pregnancy is varied. We have previously mentioned the tendency of the growth of the abscess toward the liver; pelvic abscesses do, however, occur, but they are usually the result of operative interference disturbing the old adhesions. The case of Labhardt is an example of this. The uterus was curetted to remove the fetal products, when an abscess developed in the cul-de-sac. Oidtman, too, reports such a case. Lehardt, Pinard, Oidtman and Marx describe cases in which an abscess developed in the left iliac region as a result of operative interference. We find cases, however, in which the uterus and adnexa, and even the uterine contents, become infected, even when no manipulation takes place. Lepage describes a case in which the uterine wall contained several abscesses as a result of direct infection from the appendix, and Semb a case in which the uterine tissue showed inflammatory changes preceding pus formation.

It is possible for the infection to spread directly through the tube, infecting the contents of the uterus or developing an endometritis. Semb reports a case in which the right tube and ovary were involved, an ulcerated area of the decidua around the right tubal horn and an infection of the amniotic fluid were also noted. The fetus was not macerated. He reports a second case in which the pus was found in both tubes, having passed through the uterus from the right tube to the left. Fraenkel claims that the contents of an appendiceal abscess may empty through the tube. Hlawacek reports such a case. Rostowzew describes a case in which the infection spread from a curetted uterus to the appendix.

Deaver claims that changes take place in the placental tissue in those cases in which the uterine wall forms part of the abscess wall. Thomason describes such a placenta as follows: "Peculiar feel due to calacerous degeneration; free surface, whitish appearance, showing here and there elevations resembling nodules of inflammatory lymph, while the large blood vessels and their tracts were enveloped in and covered with yellowish-white deposit of plastic material." Thomason is inclined to regard this condition as an inflammatory process, stopping just short of pus formation, permitting, it seems to me, much room for doubt.

The symptoms of an appendicitis during pregnancy do not differ in any way from the classical symptoms. The diagnosis may be difficult, especially during the latter months of pregnancy, when the size of the uterus is such as to make a satisfactory examination of the abdomen impossible. Fraenkel proposes to overcome this by placing the patient on the left side. The vomiting of pregnancy is not accompanied by an elevation in temperature, and in this way may be differentiated from the vomiting of an appendicitis. Pinard suggests that the appendix be regarded as the offending body in all cases of right-sided pain, which cannot be explained by uterine contractions.

The effect of labor upon an appendiceal abscess depends entirely upon the relation of the abscess to the internal genitals and the strength of the adhesions which have formed. While the entire maternal mortality in this class of operated cases is 32 per cent., in those cases in which an abortion precedes or follows directly after the operation, 55 per cent. die; a difference of 23 per cent. to be accounted for by the breaking up of the abscess wall. Freund reports a case in which the patient died directly after delivery as a result of the tearing of the abscess wall by the contracting uterus.

It did not take long to determine the inadvertency of emptying the uterus before operating. Some of the first cases were treated in this way with fatal results. Pinard reports a case with death in 24 hours. We know that it is possible to open an abscess and drain in a large percentage of cases without disturbing pregnancy. Should labor follow the operation, it rarely occurs before 24 hours, and this gives our drainage a chance to have accomplished much. McArthur's suggestion to empty the uterus directly following operation, even before the abdominal incision has been closed, has likewise been found unwarranted. We may say with Fellner, that the prognosis improves the earlier such cases are operated and

with the length of time elapsing between the operation and delivery.

Of the cases of appendicitis during the puerperium, there are 22, including the one which I desire to report.

Mrs. H., age 27 years, was admitted to the Parker Memorial Hospital January 3, 1904. First menses at 14 years, regular and duration 3 to 4 days. Has had three children, the youngest eight weeks, having been born November 8, 1903. From this time she dates her present trouble. On the second night after the birth of child, patient had a chill, fever, and pain throughout the abdomen, gradually localizing itself in the right side.

When first seen upon admission to the hospital, the patient impressed one as being very ill. Her temperature was 102° F. Abdomen was somewhat distended, and in the right inguinal region a mass could be palpated, growing out of the pelvis and extending to the umbilicus.

Vaginal examination revealed a uterus somewhat enlarged, normal position, and fairly movable. From the right horn of the uterus a tumor could be palpated directly continuous with the tumor noted upon abdominal examination. The tumor did not extend deep into the lateral fornix, in fact it could be palpated with difficulty. Left adnexa free.

Diagnosis.—Tubo-ovarian abscess of puerperal origin.

Operation.—Median incision, small amount of free fluid. Uterus was normal, as also right tube, which passed over an ovarian cyst about the size of a small orange. No adhesions to tube and contents of cyst was serous. The thickened ligament of Clado passed directly from the mesovarium to a retrocecal abscess of appendiceal origin. The ligament was infiltrated and slightly fluctuating. Ovarian cyst was not removed, so as to avoid the escape of pus from the ligament. The condition of the patient was such that no attempt was made to find the appendix. A second incision was made and the abscess drained retroperitoneally. After a few days, during which time the condition of the patient was a precarious one, she began to improve and left the hospital on February 18, 1904. The sinus had closed completely, but after some weeks opened again and discharged.

On June 25, 1904, during my absence, the patient again entered the hospital with an elevation of temperature. The sinus was packed and drained until my return on July 9, when a second operation was performed.

Abdominal incision. Ovary which at previous operation con-

tained a small cyst, was now the size of a double fist and contained pus. This was removed and the ligament ligated without the escape of pus. A perforated appendix, retrocecal and bound down by adhesions, was removed. Before closure of the abdomen, the old sinus was curetted.

Patient made an uneventful recovery. Sinus closed in ten days. Discharged July 21, 1904.

This case shows the difficulty of diagnosis. A typical history of puerperal infection, with an ovarian cyst complicating the appendiceal abscess, made a correct diagnosis very difficult. A careful history taken after the operation revealed two attacks, five and eight years respectively, which could now be diagnosed as appendicitis. The direct infection of the ovary through the ligament of Clado between the two operations, is of interest.

In 16 per cent. of this class of cases, a history of appendicitis before labor was noted. Frequent mistakes in diagnosis are made—a puerperal infection being the most common. Infection of the uterine cavity from the abscess is more frequent than in the other class of cases. Maute and Lepage report such cases.

Of the reported 22 cases, 50 per cent. were operated with a mortality of 36 per cent., as compared with a general mortality in this class of 54 per cent.; 15 cases, or 68 per cent., developed abscesses.

Summary.—1. Of the 143 cases collected, 52 occurred during pregnancy and were not operated; 69 cases were operated during pregnancy, while 22, both operative and non-operative, occurred during the puerperium.

2. Pregnancy does not predispose to the development of an appendicitis.

3. If appendicitis has previously existed, there is usually a recurrence of the attack during pregnancy, and it runs a more grave course, as evidenced by perforation and abscess in 50 per cent.

4. The uterus, adnexa and uterine contents may readily become infected during pregnancy from an appendiceal abscess.

5. The same surgical principles are applicable where the complication of pregnancy exists, as in uncomplicated cases.

6. Operation itself does not disturb pregnancy. No case of operated chronic recurrent appendicitis was disturbed.

7. Where the complication of abscess existed, 57 per cent. aborted, regardless of the method of treatment.

8. Every care should be employed not to disturb the pregnant

uterus during operation, for our prognosis improves with the amount of time which elapses between the operation and the abortion or labor.

9. Abortion or labor following within 24-48 hours after operation gives a maternal mortality of 55 per cent., an increase of 23 per cent. over the general mortality of this class.

10. Maternal mortality.—First class, 14 per cent.; second class, 32 per cent.; third class, 14 per cent., giving a general mortality of 28 per cent.

11. Fetal mortality.—First class, 20 per cent.; second class, 55 per cent., giving a general mortality of 40 per cent.

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ARTIFICIAL DILATATION OF THE PREGNANT AND PARTURIENT UTERUS.*

BY

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RECENT acquisitions to our obstetrical knowledge have been largely on the side of surgical, or at least, active operative procedures. In the presence of serious complications one is no longer content with the expectant plan of treatment, but prefers rather, under anesthesia and after the manner of a modern surgical operation, to quickly overcome the difficulty by rapidly emptying the uterus. There can be no question that such active obstetrics have achieved brilliant results and that many lives, both fetal and maternal, have been rescued which would otherwise have been sacrificed. And while this is certainly true, it must not, however, be forgotten that the successful employment of such procedures depends upon very important conditions—conditions affecting both patient and physician as well as the circumstances under which the procedures must be carried out.

The indications for active interference must first of all lie with the patient and not with the physician. The fact that an operator is more familiar with active surgical than conservative obstetrical procedures, is no valid reason why he should resort to the former when the latter alone is indicated. Modern obstetrics demand much greater knowledge on the part of the obstetrician than heretofore. He must have such a thorough knowledge of the physiology and pathology of pregnancy and of the mechanism and course of normal and abnormal labor as shall enable him to decide intelligently whether or not interference is indicated; he must have such experience in estimating the value and choice of procedures as shall alone enable him to select the one that is indicated and to fix the exact point of time at which it shall be carried out; he must furthermore have had such technical training as shall

* Read before the Allegheny County Medical Society, December 19, 1905.

fit him for the exact performance of any operation that may be necessary. And again, a course of action which may be safe and indicated for a skilled operator, with, or at times, even without good hospital surroundings, may be for the general practitioner in private practice "too complicated, too difficult and, therefore, too dangerous."

It is in the light of the above observations that the value of certain new obstetrical operations must be estimated. This is especially true of procedures employed in dilating the pregnant and parturient uterus. No other subject in operative obstetrics has in recent years received such exhaustive and varied consideration, and no other operation has had at the time both such unlimited praise and such unqualified condemnation as forcible dilatation of the os uteri—the so-called *accouchement forcé*. And whereas the discussion, even in the minds of the best men, is not yet closed, there is, however, a growing uniformity of opinion as to the employment of certain methods of dilatation in certain cases, and the subject is beginning to assume a more practical aspect. We are learning to estimate with greater care the usually extravagant claims of the originators of new procedures and to guard against a too hasty acceptance of sweeping criticism on the part of opponents. The exact truth lies somewhere between these two extremes, and it shall be our pleasant endeavor to seek it out.

It must first of all be remembered that pregnancy and parturition are in themselves normal, physiological processes, and that any interference with their natural course and termination presupposes the existence of abnormal conditions and must carry with it full justification. The physician's responsibility in such cases is enormous, as more knowledge and experience are often required to avoid an operation than to perform it.

In choosing a method of dilatation, three important factors must receive due consideration: (1) the condition of the cervix and os; (2) the urgency of the case; and (3) the irritability of the uterus as expressed by its response to certain stimuli. The first two factors can be definitely determined, and will indicate the method to be employed, while upon the latter will largely depend the success of the procedure.

It is a fact of common observation that a most remarkable difference in the irritability of different uteri exists. A seemingly trivial disturbance may be sufficient to induce an abortion

or labor, which, in spite of all treatment, goes on to a speedy termination. On the other hand, severe bodily injury, attended even by great shock, grave abdominal operations and even curettage have not terminated an existing pregnancy. Many explanations of this difference are without practical results. We are but certain that it exists, that it cannot in any wise be previously determined, and that for this reason one can not place implicit confidence in any method of dilatation which depends alone for its success upon uterine contractions excited thereby.

The condition of the cervix and os is largely dependent upon the age of the patient and upon the date and number of the pregnancy. Through congestion and serous infiltration the cervix is much softened and becomes more and more dilatable as the termination of gestation approaches. A scarred or indurated condition of the cervix prevents normal softening, rendering thereby dilatation more difficult and at times even impossible. In primipara the cervix normally remains intact until the last month of pregnancy, during which time and before the beginning of labor, it is as a rule wholly obliterated. This is accomplished by an unfolding of the canal from within out, in such a manner that as the internal os widens the canal shortens until both are effaced, leaving only the internal os undilated at the beginning of labor. In the multiparous woman, conditions are quite the reverse. Throughout pregnancy the external os and at least a part of the canal remain patulous. The internal os, usually closed during the early months of pregnancy, is, during the latter part of gestation, always open, so that the finger may often be easily passed through the canal into the uterine cavity. In a primipara, therefore, with a normally obliterated cervix, the active first stage of labor consists simply in dilatation of the external os; whereas, in the multipara, the external os, offering less resistance, is simultaneously dilated with the lower part of the canal after the beginning of labor.

Wherever possible, a method of dilatation should be selected which, in its working, simulates nature's method of emptying the uterus; namely, the stimulation of uterine contractions, which, through retraction of the corpal and distraction of the cervical musculature, opens the uterus and expels its contents. As already shown, however, all such methods are at times slow and uncertain, and can not be depended upon in urgent

cases, and so it happens that rapid and even forcible dilatation becomes at times necessary.

The indications for rapid dilatation become more and more urgent as the gravity of the situation increases, and procedures more and more radical succeed each other with increasing vigor, as the more conservative measures fail. Experience has taught that methods ordinarily dependent upon uterine contractions alone become more effective when combined with a certain amount of mechanical force. Forcible dilatation not only assists directly in opening the uterus, but acting as a powerful stimulant to uterine contractions renders the normal process thereby more effective. Any method of forcible dilatation therefore, which, under the circumstances, makes the fullest possible use of excited uterine contractions, is to be highly recommended.

Whatever the method employed, it must be capable of being aseptically carried out; it must bring about the necessary dilatation in the shortest possible time but with the highest possible degree of safety, so that "neither during nor after the operation severe hemorrhage or other dangers are to be expected."

Artificial dilatation during pregnancy is done but for two purposes—the induction of abortion and of labor. The former is done during the early months of pregnancy before the child is viable and, therefore, in the interests of the mother only. The latter is performed during the latter part of gestation at a time when the child is capable of extrauterine life, and hence with due consideration for the lives of both mother and child.

Induction of Abortion.—For convenience of discussion the following suppositions are made: (a) Absence of pain, hemorrhage and infection; cervix intact; internal os closed; external os opened or closed according as the patient is a primipara or multipara. It is in this combination of conditions, according to most eminent German authority, that the use of laminaria tents is indicated. If properly used, their employment is absolutely free from infection or injury. They are certain in their working and without pain or discomfort to the patient, a combination of results which can not be obtained by any other method. Leopold says that he has never seen a failure, either as regards asepsis or from the standpoint of prompt, sufficient opening of the canal. I have seen such uniformly excellent results from their employment in the German

clinics that I am compelled to accept the truth of this statement. The great objection to the method is that it is slow, at least twenty-four and not infrequently forty-eight hours being required. It is a question, however, if in certain cases any other method giving quicker results can be employed with safety. This is especially true where a fully intact, rigid, and, at times, elongated cervix is to be dilated. Even in such cases it is exceedingly rare that more than forty-eight hours are required for dilatation by tents, which can not be said of other equally safe methods; and furthermore, except in urgent cases, it is also questionable if, in the presence of such safety, certainty and comfort, a more rapid method is required or even advisable.

There is, however, another and larger class of cases, in which the cervix and os, even early in pregnancy, permit with safety of more rapid dilatation. Under such circumstances tents are unnecessary and therefore inadvisable. In such cases it is best to do preliminary dilatation up to the limit of safety by means of Hegar's graduated dilators, and then, according to the suggestion of Fritch, to rupture the membranes with a sound and to pack the canal firmly with sterile gauze saturated in a 10 per cent. solution of ichthyol in glycerin. By this combination uterine contractions are usually promptly excited, the cervix is softened and opened, so that at the end of twenty-four hours when the gauze is removed the ovum, as a rule, comes away with it; if not, it may readily be removed, preferably with the fingers, or with a suitable forceps, or at least, by means of Orthmann's curet, beautifully adapted for this purpose. Should the fetus be so large that it can not be removed through the acquired dilatation, the canal will at least admit a rubber bag and the emptying of the uterus may be accomplished as later described.

(b) The second supposition is that in which abortion has inevitably begun. Here a firm tamponade of the vagina through a bivalve speculum will be sufficient to control the bleeding and to stimulate the opening of the uterus, so as to allow the discharge of the ovum and its removal with the packing at the end of twenty-four hours. If, however, this be not the case, the warning is given not to attempt to clean out the uterus with insufficient dilatation as one is sure to regret it. Hemorrhage is at times profuse and can only be controlled by packing the uterus or removal of the ovum. If the former

is done, the emptying of the uterus must be postponed twenty-four hours, and nothing is gained. If the latter is attempted with necessary haste, severe lacerations are common and an imperfectly completed abortion is the rule, which always gives an unfavorable prognosis. If the necessary dilatation can not be accomplished with Hegar's, Goodell's, or Bossi's dilator, it is better to pack the canal according to the method of Fritch and wait another twenty-four hours.

Induction of Labor.—The following methods are employed and will be described in the order named: (a) tamponade of the cervix; (b) bougies; (c) rupture of the membranes; (d) rubber bags; (e) Bossi's dilator, and (f) vaginal hysterotomy.

Tamponade of the cervix as employed by Hoffmeier is safer and is said to be somewhat more certain than the bougie. The canal including the internal os is firmly packed with iodoform gauze saturated with sterile glycerin. The well-known oxytocic action of the glycerin, added to the effect of the tamponade, appeals to one as at least theoretically correct. Experience has shown that in a large number of cases further procedures are rendered unnecessary and the patient is spared intrauterine manipulation, which always carries with it increased opportunities of infection. The method is at least harmless, and whereas it frequently fails, its preliminary employment is nevertheless justifiable in all cases where time permits. Should it fail the canal is the better prepared for subsequent measures and only good is accomplished. The effectiveness of the procedure is wonderfully increased by preliminary mechanical dilatation up to the limit of safety, as already described.

As to the use of bougies so highly extolled by Hirst, Jacobey, and others, I believe that the method is at least not any more effective and certainly not so safe as the method just described. The bougie not infrequently enters the placental sight with the production of hemorrhage and increased danger of infection, especially should several days elapse before results are obtained, as frequently is the case. In addition the membranes, if thin, are easily ruptured, prolonging the labor and rendering dilatation more painful.

Rupture of the membranes as a method of inducing labor should never be employed except in hydramnios, dyspnea in pulmonary edema of cardiac origin, and in certain varieties of placenta prævia. In these conditions prompt relief is often obtained and time is gained for other procedures to be described later.

We next come to the most important because the most certain of the more conservative methods of dilatation; namely, the use of rubber bags, the colpeurynter or metreurynter according as the bag is used in the vagina or within the cavity of the uterus.

The Colpeurynter.—It ought to be a very easy matter to place a rubber bag into the vagina and to fill it with 400 or 500 c.c. of water and yet it is surprising to see how little the procedure is employed or even understood. We have in it a remarkably effective and withal simple method of dilatation. It acts not by exciting uterine contractions as is generally supposed, but by stimulating to increased vigor contractions already present and is, therefore, useless as a means of inducing labor or in exciting anew uterine contractions after they have entirely disappeared. The colpeurynter prevents premature rupture of the bag of waters so desirable to avoid in all cases of defective dilatation, and in cases of faulty positions and presentations, where preservation of the membranes renders easier probable subsequent version. It serves also as a safe and efficient means of preliminary dilatation of the vagina and introitus and is therefore especially valuable in old primiparæ in whom lacerations are so common. It is indicated as a conservative method of dilatation in all cases where in the presence of weak pains and defective dilatation it is unnecessary, inadvisable or impossible to use the metreurynter.

The metreurynter, in contrast to the methods already described, as a rule, promptly excites uterine contractions, unfolds the canal and obliterates the os from within out in a physiological manner, accomplishing full dilatation and the completion of labor in a much shorter time than is the case with the methods already mentioned. The effectiveness of the procedure is wonderfully increased by firm, continuous traction upon the tube of the bag, securing thereby the most powerful excitant and stimulant to uterine contractions known to obstetrics. And not only is this so, but the os is also more or less forcibly dilated, according to the amount of traction exerted, so that according to Dührssen and Zweifel, not infrequently in suitable cases an os but slightly opened may, in one-half to two hours, be so fully dilated that a living mature child may be born without injury to the mother.

Except in cases where rupture of the membranes is especially indicated, they are carefully preserved and the bag is inserted

between them and the uterine wall, on the side of and posterior to the occiput. The patient lies upon her back with hips somewhat elevated, care being taken to exert traction in the direction of the pelvic canal, otherwise the bag may catch upon the symphysis and fail to accomplish its purpose. The use of the bag presupposes sufficient dilatation to admit it, which frequently is the case in multiparæ, even before the beginning of labor. Preliminary dilatation, when necessary, may be accomplished by cervical tamponade according to the method of Hoffmeier, or by means of Bossi's dilator, depending somewhat upon the condition of the parts and much upon the urgency of the case. No matter for what indication it is done the sooner an induced labor is safely terminated the better the prognosis for both mother and child. Experience has taught that in such cases a certain amount of preliminary dilatation by means of Bossi's dilator is always allowable and that when employed, the duration of labor is proportionately shortened according to the amount of such dilatation. On the basis of this observation, Heller, in a series of thirty cases of induced labor, on account of pelvic contraction, reports results which have not been duplicated. A dilatation of four and one-half cm. with Bossi's instrument was followed by metreuryesis with traction. The average duration of labor in twenty-four cases terminated by version and extraction was eleven hours and thirty minutes, and in the six remaining spontaneous deliveries, fifteen hours and twenty minutes. Of the thirty children, five of which were born dead, twenty-two were discharged alive and well, as were also all of the mothers. The puerperiums were practically normal, the shortest being nine days and the longest sixteen.

Norris, in a series of eighteen cases of induced labor, in which similar preliminary mechanical dilatation, followed by a combination of bougies and bags, was used, claims an average duration of labor of seven and one third hours, all labors being terminated by forceps or version. These statistics are in themselves without special value, inasmuch as nothing is said of the indications for which the labors were induced and of the conditions of the cervix and os and no reference is made to fetal or maternal mortality or morbidity or to the puerperiums. In all of Heller's cases labor was induced for the one definitely stated condition alone, and as more rapid delivery was in no case indicated, the condition of the soft parts did not influence the choice of the procedure. In Leopold's clinic labor is never

induced in a primipara for pelvic contraction alone and so it happens that all of Heller's cases were multigravidæ, in the majority of which, had it been necessary, labor could have been terminated with safety in less than an hour by means of Bossi's dilator as later described.

Metreuryisis is a most efficient means of dilatation in cases of premature rupture of the membranes where the presenting part, still movable, is unable to dilate the parts. It has no equal in certain varieties of placenta prævia, where rupture of the membranes fails to control the bleeding. The bag is placed through a rent in the membranes or hole bored through the placenta within the amniotic cavity, filled with 500 c.c. of sterile water, and drawn into the cervix by firm continuous traction. Hemorrhage is thereby effectively controlled, uterine contractions promptly excited and dilatation rapidly accomplished.

Metreuryisis is also a most effective means of hastening a slow first stage of labor, where, in the presence of defective dilatation, the child is in danger and in cases also where, on account of subsequent version, it is essential to preserve the membranes. The common objection that the metreurynter, through displacement of the presenting part, predisposes to subsequent faulty positions and presentations is, according to Vogel, much overestimated. He states that the presenting part usually enters the pelvis after expulsion of the bag and that faulty positions and presentations may be corrected by external manipulations and by proper position of the patient. Failure of the head to enter the pelvis after metreuryisis occurs most frequently in narrow pelves and it is just in this condition that the so-called prophylactic version offers the best prognosis for both mother and child.

Forcible Dilatation.—The question first of all presents itself—is dilatation more rapid than can be accomplished by the method last described ever required and if so, is forcible dilatation ever justifiable? Our answer to the first question is emphatically yes, and in this decision we but express the opinion of the best authorities upon the subject. All obstetricians are, for example, practically agreed that the sooner after the first eclamptic convulsion the patient is delivered with safety, the better the prognosis. Especially is this the case if, with each succeeding convulsion, unconsciousness deepens, the temperature rises, and the pulse rate increases. There can be no doubt that a number of other conditions exist in which danger to the life

of mother or child, or both, demands equally rapid delivery. And as to whether or not in such cases forcible dilatation is required, we need only to show that the results thereby attained justify the means employed.

For the sake of following observations, it is therefore assumed that in the interest of the patient or patients, indications scientifically chosen do exist, which demand the most rapid possible delivery; and for the sake of convenience we shall include all such indications arising both during the latter part of pregnancy and parturition. In our discussion we shall not include the methods of manual dilatation devised by Harris, Bounaire, and Edgar as we fully agree with Norris that "their value has been discounted by the more modern methods of Bossi and Dührssen."

In cases, therefore, where rapid delivery in the presence of an undilated os is indicated, the choice lies between dilatation by means of Bossi's instrument and the so-called vaginal Cesarean section of Dührssen, better named vaginal hysterotomy by Bumm. It will be remembered that in all such cases Bossi uses his dilator with most excellent results and thus finds no necessity for the cutting operation. Dührssen, on the other hand, sees absolutely no good in the instrument, although he has never used it, and recommends his operation in all cases where metreurysis can not be depended upon. The fact is, as we shall see, that each method has found a separate and distinct place in modern obstetrical practice, and this brings us to a comparative study of the two procedures.

Bossi claims and has fully demonstrated in the presence of competent witnesses, his ability to dilate with safety both the pregnant and parturient uterus, at all stages of gestation and in all conditions of the cervix and os. As early as 1896, six years after his first report of forty-one cases before the international congress in Berlin, Bossi was able to collect from the literature one hundred and twelve authenticated cases, among which were thirty-eight cases of eclampsia, eleven of central and fourteen of marginal placenta prævia, seventeen of grave heart and lung disease, and twenty-three cases of stenosis of the os. Of this number, sixty-two were primiparæ. In forty-seven cases there was as yet no dilatation of the os and in twenty-nine the cervical canal was still fully intact. Full dilatation was accomplished in from fifteen minutes to one and one-half hours. Not in a single instance could the death of the mother, where it occurred, be charged to the procedure itself, and of the

children still alive at the beginning of the operation all but seven were rescued.

In the face even of these remarkable results, it was not, however, until 1901 that the procedure found favor outside of Italy. It was left to Leopold to visit Bossi's clinic, to study his technic, and to give the procedure an intelligent and impartial trial in his own large clinic in Dresden. The result was that in a few months a report of seventeen cases appeared, fourteen of which were eclampsia, in which Bossi's instrument was used in exact accordance with the author's technic. In all cases full dilatation was accomplished in from twenty to thirty minutes and "without any lacerations worth mentioning." All of the mothers, including the twelve cases of eclampsia, were discharged alive and well, and of the nine children still alive at the beginning of the operation all were delivered alive and saved, except two, which being premature, died a few hours after delivery. The puerperiums were normal with the exception of one patient with severe gonorrheal infection.

The results were so convincing and even brilliant, especially as regards the cases of eclampsia, that the instrument found almost immediate trial throughout Europe. Something like one hundred different publications have since appeared—the majority in favor of, but still a goodly number against the procedure. The result is that the instrument has found a definite and permanent place in modern obstetrics, which in private practice at least, can not be filled with the same degree of certainty and safety by any other method of dilatation, and to Leopold belongs the credit of establishing the correct indications for the safe employment of the procedure by the average obstetrician. Like every other obstetrical instrument, it has its own indications, requires special technic and precaution in its use, and also carries with it possible dangers. That severe lacerations have occurred in the use or rather misuse of the instrument was to be expected and may be explained through the employment of improper instruments, imperfect technic, and lack of skill; but, to condemn the instrument on such grounds alone is most unjust, as the same may be said with even more reason, of the forceps, justly styled "the bloodiest of all obstetrical instruments;" but, as we all know, also the most useful of all.

After five months of study and service as an assistant in Leopold's clinic, I am fully convinced with Hirst that "there is no reason for the prejudice against Bossi's dilator, exhibited

usually by those who have had no experience with the instrument." Hirst has used the instrument twenty-five times, nineteen times for accouchement forcé and states that the only serious lacerations which he has had, have occurred in women delivered in less than twelve minutes, and further expresses the belief that with slow dilatation there is not much more danger of a lacerated cervix than in the average labor. The opinion of this most eminent and successful practitioner and teacher certainly deserves the most careful consideration.

As to the dilator itself, it may be said that all instruments without a pelvic curve, as for example, Frommer's model, cannot be too severely condemned. Serious lacerations, accredited to the procedure itself, have unquestionably been caused by the use of such improper instruments. Krull's model, with the pelvic curve and eight branches, is in my opinion the ideal instrument.

Technic.—With two or three fingers of the left hand in the vagina, the os is located and the vagina opened. The dilator, held in the right hand as the blade of a forceps and with closed branches, is inserted properly into the cervix, and with a few turns of the screw is fixed in position. In the presence of pains, the insertion must take place between pains, as must also subsequent dilatation. With the beginning of dilatation, almost without exception, uterine contractions are produced. Depending upon the amount of tension, the screw is turned through a quarter or half circle, and if time permits, two or three pains are allowed to take place before further dilatation is attempted. With each turning of the screw the most careful examination must determine the position of the instrument, the progress of dilatation and detect the occurrence of lacerations. As the danger of laceration increases with advancing dilatation, the screw must be turned through shorter distances and with longer intermissions as dilatation progresses. And for the reason that the os, after the removal of the instrument, tends to recontract, it is advisable to dilate to a somewhat greater degree than is demanded, and, when time permits, to leave the instrument in position at the height of dilatation for ten or fifteen minutes; and for the same reason also to proceed to immediate delivery, best accomplished by means of the forceps. Version and extraction give less favorable prognosis for both mother and child, as the constriction of the os about the neck of the aftercoming head has not infrequently

been responsible for the death of the child and severe lacerations of the cervix.

According to Leopold the use of the instrument for rapid, complete dilatation is contraindicated in primiparæ with an intact cervix, in multiparæ with a scarred or indurated condition of the os, and in cases of placenta prævia. The most suitable case is "the primipara with an obliterated cervix, a closed or but slightly opened external os and a moderately low position of the head—as for example, in eclampsia." Somewhat less favorable, but still indicated, is the multipara, with an open, dilatable external os, and a patulous, somewhat shortened canal.

But what shall we do with those cases in which Bossi's dilator is contraindicated, and in which rapid delivery is demanded? It is under just such circumstances that the operation of choice is vaginal hysterotomy. As to Leopold belongs the credit for the correct use of Bossi's dilator, so to Bumm must be given the credit for the correct and practical application of Dührssen's operation. In contrast to Dührssen, who incises the cervix and uterus both anteriorly and posteriorly, Bumm does what he calls anterior vaginal hysterotomy, described as follows: An incision is made in the vaginal mucosa from a point about an inch below the external urinary meatus to the external os. At this latter point the incision is deepened for two cm. through the musculature and into the cervical canal. The bladder is separated and an incision ten to twelve cm. in length is made through the anterior wall of the cervix and uterus. The membranes are ruptured, version is performed, the placenta is expressed or manually removed, the uterus is packed with gauze, if necessary, to control bleeding, and the incision is closed. Hemorrhage from the cavity of the uterus is common, and according to Dührssen rendered manual separation of the placenta necessary in twenty per cent. of his cases. Machenrodt and Hoffmeier state that extension of the incision, by laceration during extraction, at times occurs; and Dührssen says that in primiparæ with a narrow vagina and introitus, deep incisions into the pelvic floor, including even the levator ani, are occasionally necessary.

From the above description it is evident that the operation is always a serious one, and, at times, even most dangerous and should, therefore, never be undertaken except by a most skilled vaginal operator with competent assistance and good

hospital surroundings. I desire, however, not to be misunderstood. I believe the procedure to be both theoretically and practically correct, and am fully convinced that in certain suitable cases no other operation or plan of treatment can properly take its place. Even in those cases, however, where vaginal hysterotomy is the operation of choice, it will frequently not be possible, under the circumstances, to carry it out. In such cases preliminary dilatation with Bossi's instrument up to the limit of safety, followed by metreurysis with firm continuous traction will always give better results than Dührssen's operation under unfavorable surroundings and, except in a very small percentage of cases, will also be sufficient.

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 THE PROPHYLAXIS OF ABDOMINAL ADHESIONS.

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It is quite impossible to prevent the formation of adhesions due to intraabdominal inflammatory processes, neoplasms and traumatism. The favorable outcome of a particular lesion may depend upon them, and in pus formation they represent a life-saving process. Adhesions occurring in hernias are usually the result of neglected treatment, and can, therefore, at least in a large majority of cases be prevented. Their prophylaxis natur-

ally depends upon the general principles of the treatment of hernia. Following traumatism, one might attempt to prevent the formation of adhesions by stimulating peristalsis; this, however, would probably be a dangerous undertaking, as it is never a matter of certainty whether or not some point of the gastrointestinal canal is not involved. For this reason, quiet of the intestine is usually secured by means of an opiate, so that the injury may not be transformed by peristalsis into a complete rupture. In reality, only adhesions following abdominal operations may be to a certain extent prevented.

Strictest asepsis is of course the greatest requisite, and includes the well-known principle of not touching any parts with instruments or hands which are not surgically clean. The operator is compelled to use his hands, which usually are not strictly aseptic, and mechanical lesions of the peritoneum may result. This serous membrane should always be dealt with as delicately and gently as possible, and all superfluous and rough manipulations with instruments or hands should be carefully avoided. Clamps, and so forth, used to catch up the peritoneum, should always be smooth. The so-called toilet of the abdominal cavity, in getting rid of blood, or the contents of cysts, is unnecessary in most cases, but, when this is required, flushing with sterile salt solution, followed by careful mopping, may be resorted to. Chemical solutions should always be kept at a safe distance from the operating table, and are only to be used for rinsing the hands during the operation.

Another very important point is keeping the peritoneum warm and moist during the operation, by covering it over at every point where it comes in contact with the air, with warm, moist gauze sponges, wrung out in normal salt solution, or the following, which has been recommended by the Germans: Sodium bicarb., 2.5; sodium chloride, 7.5; distilled water, 1.000. This latter composition has the advantage that at the same time that it makes the gauze somewhat slippery, it more nearly corresponds to the nature of the physiological peritoneal fluid.

Gauze sponges have been thought to have an injurious effect upon the serosa, for the reason that by evaporation they rapidly cool off the surface, but by soaking them in one of the above solutions and frequently changing them this may be prevented. Then again, evaporation cannot go on so rapidly, because the sponges are usually covered by the assistant's hands holding back the intestines.

The advocates of the use of dry, warm cloths and compresses have tried to show by statistics that intestinal occlusion more frequently occurs when the moist method is used, but in point of fact they have been unable to prove that the latter is really at fault. It goes without saying, that the dry treatment of the peritoneum is not physiological, because, as Schiffer states, the dry compresses often become adherent to the intestinal coils and with the peritoneum, and the latter will be found to lose its luster and present a dried appearance. This simply demonstrates that the peritoneum has sustained injury. In Sanger's clinic, where the bicarbonate and chloride of sodium solution is employed, a marked decrease in intestinal disturbances following laparatomies has been observed.

Since, however, one can never be absolutely certain that an infection or mechanical lesion has not been inflicted, especially in complicated and long abdominal operations, one should in these cases stitch over all the raw surfaces, if possible, with healthy peritoneum.

Suture of the abdominal walls requires particular care, because, to a great extent, it tends to the formation of adhesions. A most exact suture of the peritoneum will always leave a minute wound surface, which, if infected, will result in the formation of adhesions; therefore, it is better practice, when the edges of the peritoneum are united, to do this entirely outside of the abdominal cavity, and, to accomplish this, it should always be closed by a separate suture of fine catgut. I also believe that this greatly influences the prevention of post-operative hernia.

The method, which may be termed laparoplastic, is carried out as follows: The free edges of the peritoneum are picked up with forceps, or, better still, seized at some little distance from the edge, and pulled up into the abdominal wound, and then the sutures are inserted. These are best applied according to Lembert's method, so that when the peritoneal wound is closed, healthy peritoneum is approximated to healthy peritoneum. The fascia is next carefully united with a continuous kangaroo tendon suture and the skin and fat with silkworm gut.

In order to prevent adhesions arising between the peritoneal wound surfaces which are in contact with each other, several methods may be resorted to, none of which, however, can be said to be absolutely reliable. Of special importance is the prevention of adhesions in cases where adhesions have been broken down on account of ileus, or to relieve intraabdominal pain, because this

results in raw peritoneal surfaces, which, by coming together and uniting, result in the reformation of adhesions and thus to a return of the primary pathological condition.

We will here consider the prophylaxis of recurring adhesions. It is sometimes possible to isolate the raw surfaces by inserting between them an organ possessing an intact endothelial covering; thus, for instance, the omentum may be brought down between the uterus and abdominal wound in cases of Cesarean section, and so prevent adhesion. In the same way it may be spread out over the abdominal surface after breaking down adhesions existing between the viscera and the anterior abdominal wall. The sewing over of the healthy peritoneum to cover the raw surfaces is possible only when the latter are of slight extent, and, in point of fact, it is of infrequent occurrence that the formation of adhesions is prevented, because the suture points in their turn easily become adherent; still the process is thus limited in extent. In adhesions resulting from sutures the adherent part should be resected, and from this results such a large space between the fresh raw surfaces of the omentum and the spot where it was adherent that a recurrence of the adhesions is well nigh an impossibility. For all this, great care of the omental stump is necessary, because peristalsis has no motor action upon it, and it naturally has a tendency to adhere to the abdominal wound suture, or the parts involved during the operation. Bumm has recommended turning the edges of the wound in the omentum outwards, so that adhesion can only take place with the parietal serosa and not with the intestines. By this method intraabdominal pain may result after recovery, or the formation of a pocket may arise, causing intestinal obstruction. Another method of obtaining a good union of the omental edges is turning them over twice, as in an ordinary hemstitch, and then fixing the line of union with a fine continuous stitch. In some instances, where extensive omental adhesions are present, the entire omentum may be resected and the stump treated in the above manner. In the few cases in which this has been done, the results, so far as I am aware, have been good.

All these methods are applicable in certain cases, but they prolong the operation considerably, and, of course, with this goes the additional risk of infection and extensive formation of adhesions. It therefore appears to me more desirable to possess some means which will prevent adhesions from arising in all

cases, especially those where extensive peritoneal wound surfaces remain after the operation.

The rather adventurous experiments of Stern and Duschinsky of obtaining this result by the use of vaseline, tallow, collodion, or gold-beater skin, have given miserable results, and besides, technically, the execution of this method is hardly possible. Muller attempted to prevent the contact of the raw surfaces by pouring into the abdominal cavity a large amount of sterile normal salt solution at the completion of the operation. In two cases where this was tried, it appears to have resulted favorably.

The experimental test, however, was unsatisfactory, because Stern, Duschinsky and Vogel found slight, or even tough adhesions, and only in two experiments done at a later date by Duschinsky were the adhesions absent. Theoretically, this proceeding has been condemned on the grounds that the solution is too rapidly absorbed to be able to prevent the formation of adhesions, that the over-repletion of the circulation produced by the rapid absorption is not without danger, and lastly, that the most that can be expected is that adhesions in the deeper parts of the abdominal cavity may be prevented, but not those arising between the intestinal coils, because the latter, while floating in the fluid, are in close contact with each other. Then again, as a result of the distention of the abdomen by the fluid, the diaphragm is pushed upwards, causing dyspnea, as was observed in Muller's case and in the animal experiments. The result of this is that the development of a post-operative pneumonia is favored. For all these reasons the use of this method should be discarded.

There is a much more rational method for the prevention of adhesions, because its aim is not to prevent direct contact of the wound surfaces, but to keep the serous surfaces in constant motion, so that no two raw peritoneal surfaces remain in contact with one another long enough to result in union between them. Consequently, if this can be attained, the endothelium will regenerate and a physiological protection against adhesions thus accrues. That this is possible is proven by the rather infrequent occurrence of adhesions between the anterior wall of the stomach and the parietal peritoneum, although the two surfaces are constantly rubbing against each other in opposite directions on account of the movements of respiration. Adhesion between organs possessing a slight mobility, or none at all, as, for instance, between the omentum and abdominal wall, can certainly not be prevented by this means. The principal way to produce a constant change of

contact of the peritoneal surfaces is to stimulate peristalsis immediately after an abdominal operation. Adhesions already existing, which have not as yet become organized, can, in this way, be loosened. A less active means for continually changing the position of the intraperitoneal surfaces is massage of the abdomen, which, at the same time, increases peristalsis and deep respiration, especially in pathological processes in the liver, stomach and spleen. There is another excellent feature of massage, and that is that it is a prophylactic for post-operative pneumonia. Formerly opium was usually administered after laparotomy, so that, if infection should arise, it might be more easily located, but Lawson Tait and French surgeons, on the contrary, resorted to laxatives. More recently this practice has been highly recommended by a number of German operators. Besides its action on the prevention of adhesions, stimulation of peristalsis has the great advantage in cases of infection that the bacteria become rapidly disseminated throughout the entire abdominal cavity, and can be easily rendered harmless by the peritoneum. Otherwise, there may be foci endeavoring to resist the bactericidal influence of the peritoneum, and by multiplying they may lead to a generalized peritonitis. It has also been shown experimentally by Noetzel that an infection with a given amount of septic material will result in death if opium be administered, whereas the result will be favorable if timely active peristalsis is obtained.

Opium, after laparotomy, is indicated only in three conditions: Where a primary focus of infection has been left behind, one which will remain localized, and after resection of anastomosis of the stomach and intestines, because here the danger resides in the fact that the suture may become insufficient, especially in cases where the walls of the organs are the seat of some pathologic change rendering them friable.

The means employed for stimulating peristalsis must not be too mild, particularly in cachectic and senile subjects, as those afflicted by chronic constipation arising after laparotomy, as a result of a reflex paralysis, for they are frequently in a low vital condition and require rather sharp measures for stimulation of the intestine. Furthermore, the intestinal stimulant should be employed immediately after the operation, because very little time is necessary for the formation of adhesions. Laxatives given by mouth, such as saline waters, castor oil in black coffee, or calomel in small doses, are not to be recommended on account of the post-narcotic vomiting. Small subcutaneous injections of

strychnine have been tried twenty-four hours after the operation. Experimentally, Vogel employed injections of atropin with good results, but, on account of its toxic action it cannot be recommended. He greatly praises the subcutaneous use of physostigma, and found that this alkaloid at the dose of 0.0004 immediately after the operation, and continued three times daily for a few days, gave rise to peristaltic action in the shortest time possible, with copious stools and without disturbing the stomach or the general condition in any way. Von Noorden has highly commended this remedy as a laxative, and it has also been the object of research of Dr. Daniel Craig of Boston. Upon his recommendation, I have resorted to the use of this drug in a varied series of cases, and I must confess that in my hands it has proven all that is claimed for it. I have, however, gone further than Craig, inasmuch as I have followed the recommendation of the German surgeons to continue its use for several days following the interference.

Ditzel's practice is to give a large soap and water enema soon after the operation, and this is followed several hours later by an injection of glycerine. By this means a marked peristalsis is set up almost without exception, with the expulsion of flatus and abundant dejections. This method has the very great advantage of being quite harmless, although in weak and irritable subjects it may be exhausting. I believe that to give strong cathartics before abdominal operations is unwise, because they certainly weaken the intestinal muscle.

Besides the above mentioned means for the production of peristalsis, some slippery fluid has been experimentally sought, which in small quantity may incorporate itself on the raw wound surfaces of the serosa, replacing the physiological lubricant, and, at the same time, heighten the passive mobility. Glycerine was found not to possess the power of preventing adhesions, while sterile olive oil greatly irritates the peritoneum, and is, therefore, quite as useless. Egg albumin, a mixture of mucin and a thick solution of gum arabic have all been tried, and, with the latter, Vogel obtained complete success in all complicated cases when this method was combined with stimulation of the peristalsis; formation or recurrence of adhesions was prevented. Therefore, in doubtful cases, a sterile gum arabic solution might possibly be advised experimentally, for it can hardly be considered as dangerous. Another method used by Ditzel is to excise a bit of fat from the abdominal wall, and, squeezing it out, to rub it into the raw peritoneal surfaces.

A CONTRIBUTION TO THE ANATOMY OF HERNIA OF THE FEMALE PELVIC FLOOR.*

BY

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(With three illustrations.)

It is so seldom that we have an opportunity to study hernia of the female pelvic floor in the cadaver that I have thought it worth



FIG. 1.—Procidentia Uteri.

while to present this case to you, and to ask you to study with me its pathological anatomy, and to see what lessons in treatment it may teach us. The body having been preserved by injection with 2½ per cent. formalin, I first made a cast of the parts as they appeared externally (Fig. 1), and later made a sagittal mesial

* Read before the South Texas District Medical Association.

section through the pelvis, such a section being always easy and accurate in a formalin-preserved body without the necessity of freezing.

On external examination (Fig. 1) the whole vagina is seen to be everted, the infravaginal cervix uteri and its os occupying very nearly the center of the tumor. There was no marked erosion of the vaginal mucosa.

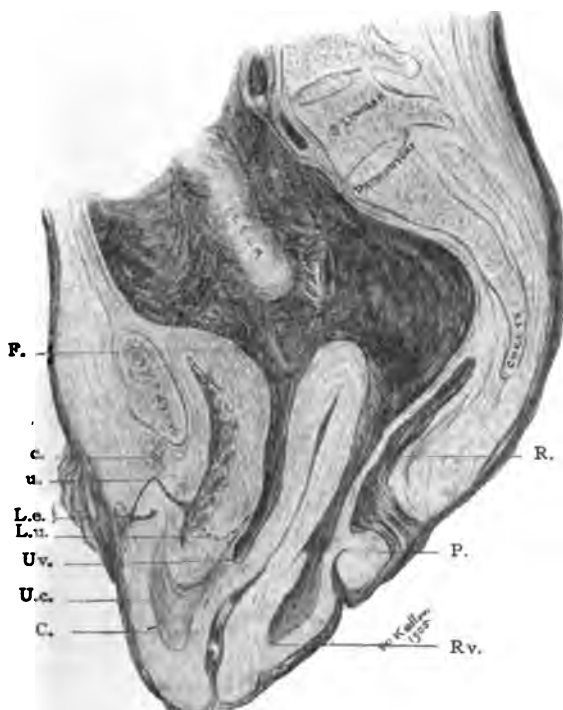


FIG. 2.—Sagittal Mesial Section, Procidentia Uteri.

F.—Fallopian tube.
c.—Crura of clitoria.
u.—Urethra.
L.e.—Line of eversion of ventral vaginal wall.
L.u.—Line of Ureter.

U.v.—Uterovesical cul-de-sac.
U.c.—Uterovesical connective tissue.
C.—Cervical canal with polyp.
R.—Rectum.
P.—Point of eversion of dorsal vaginal wall.
R.v.—Rectovaginal cul-de-sac.

Passing now to the section (Fig. 2), the hernia is seen to contain two-thirds of the contracted bladder, the lower three inches of the ureters, and half of the urethra; the whole vagina, which is completely everted, at least four inches of a much-elongated uterus, the anal canal, and 5 cm. of rectum, as well as the uterovesical and rectovaginal pouches of peritoneum. The fundus

of the uterus is only slightly lower than normal, and appears to be supported by the round ligaments, and Fallopian tubes and infundibulo-pelvic ligaments, the cervix uteri receiving marked support from the uterosacral ligaments, which appear to be strong and very rich in muscular fibers. The uterus is very much elongated, measuring 16 cm. in length, of which 11 cm. appear to be body and 5 cm. cervix. It is not wider than normal, being 5 cm. between the cornua. In the fundus is a small intramural fibroid, which has undergone calcareous infiltration, and on the dorsal wall is a sessile fibroid nodule, about 2.5 cm. diameter at its base. The vaginal walls are completely everted, the anterior wall carrying the bladder with it and being much thickened (it varies between 1 cm. and 2.3 cm. in thickness), while the posterior wall has broken loose from its connections with the rectum, so that the rectocele is very moderate and the rectovaginal cul-de-sac of peritoneum extends down to near the lowest limit of the hernia. The vesicouterine pouch of peritoneum maintains its relative relations to bladder and uterus almost unaltered, but has descended with these structures. There is a decided increase of loose connective tissue between the bladder and vagina and cervix uteri.

The bladder, instead of entirely lying within the pelvis, its base above the lower level of the symphysis, has descended so that its apex (in its contracted condition) is somewhat lower than the upper margin of the symphysis, and its base descends to fully 5 cm. below the symphysis. The clitoris has by its firm pubic connections retained the outer 2 cm. of the urethra in nearly the normal situation, but the inner (proximal) half of the urethra is bent downward at an acute angle to the distal portion, rendering micturition very difficult. The greatly hypertrophied bladder wall (1.5 cm. thick at its thickest part) is evidence of the urethral obstruction.

The lower end of the ureter has descended with the bladder and cervix uteri, to which latter and the uterine artery it maintains its normal relations. It passes downward and forward beneath the uterine artery, crosses the cervix uteri 5 cm. from the external os, and curves forward and upward in the bladder wall. From where it passes beneath the uterine artery upward to the kidney, the ureter is much dilated, and as the lower limit of the dilatation corresponds to the level of the vaginal entrance (line of vaginal eversion), it is rather suggestive that the constricting ring here, or perhaps that and the sudden bend on the ureter at

this point, may partly account for the hydronephrosis which we find in both kidneys (Fig. 3). Both kidneys are in a condition of extreme hydronephrosis, the secretory substance being very much reduced. This may be accounted for by the constricting ring just described, by the bend of the ureter where it pierces the bladder wall, by possible kinking as the bladder filled, and by the strong expulsive efforts necessary during micturition to over-



FIG. 3.—Hydronephrotic Kidney, 15 centimeters in length, from case of *Procedentia Uteri*.

come the obstruction caused by the acute bend in the urethra. An analogous condition in the male is the hydronephrosis occasionally caused by a large prostate.

The whole rectal segment of the pelvic floor is elongated at least 5 cm. beyond the normal; but there is no marked rectocele, since the vagina has broken away from its rectal attachments and Douglas's pouch descends into the hernia.

Perhaps the kidneys of this case teach the most important

lesson. Nothing could emphasize more strongly the necessity of early treatment of prolapse of the pelvic floor so as to prevent renal complications. No warning could be plainer to be guarded in giving a prognosis in extreme cases of sacropubic hernia. We all know how guarded the prognosis must be in prostatic enlargement in the male, and how much depends on the condition of the kidneys. Do we realize how often the kidneys are involved in procidentia uteri?

Apart from renal involvement, relief by operation in such a case presents considerable difficulties. Resection of the uterus would not correct the vaginal and bladder prolapse, and would seriously weaken the pelvic floor. The operation described by Kelly seems the most suitable. The vaginal attachment to the uterus should be shifted up, two, or perhaps three, inches of the cervix being amputated, and the vagina attached to the stump of the uterus. The vagina should be narrowed by anterior, posterior, and perhaps lateral colporrhaphy, and lastly it would seem serviceable to firmly attach the fundus uteri to the abdominal wall.

In the presence of albuminuria and difficult and frequent micturition, much care would be required in deciding whether operation should be advised at all. It is evident that in such a case as our specimen presents operation could only have hastened the end, or, if undertaken at all, should be done under spinal anesthesia, that the almost surely fatal effect of ether or chloroform on such kidneys might be eliminated.

THE TOXEMIA OF PREGNANCY.

BY

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(Concluded from page 164.)

Etiology.—In discussing the etiology of such pathological conditions in the pregnant state as we have described we are compelled because of the insufficiency of our knowledge to deal largely with hypothesis and theory. The consensus of opinion to-day and the weight of evidence deduced from a study of eclampsia, hyperemesis gravidarum and unclassified fatal cases in pregnancy point unmistakably to their toxic origin. The

nature of the poison, its source and mode of action are all matters of speculation and subjects for research. But that there is some substance or substances in all probability endogenous in the gravid female, which give rise to the abnormal conditions mentioned, there is very little doubt.

The attention of most clinicians and investigators has been directed to the study of eclampsia and much less to hyperemesis and other clinical pictures such as our first case presents. But according to our view there is little essential difference to be found between these pathological states. It is held to be characteristic of eclampsia that there shall be tonic and clonic convulsions, but Schmorl describes three cases, and Meyer-Wirz a fourth, which had no convulsions and yet had the typical pathological lesions of eclampsia. In every textbook of obstetrics mention is made of eclampsia without convulsions, and the picture given is nothing more or less than that of a severe toxemia. The symptoms often described as cholemic eclampsia are exactly like those of Case I and correspond to the clinical picture of acute yellow atrophy in every essential. An impartial observer oftentimes cannot distinguish between the clinical reports of some of the fatal acute cases of hyperemesis and eclampsia without convulsions.

Eclampsia when described as a clinical type is distinctly different from the typical cases resembling acute yellow atrophy, and yet there are cases which assume an intermediate position between them. In the one case it may be that the poison has an especial affinity for the motor cortex, in another case for the vomiting center, and in still others for the higher intellectual centers, early causing delirium, stupor and coma. In other toxic states such as scarlet fever, diphtheria, typhoid fever, etc., the toxin has a selective action on the viscera. Sometimes the picture in typhoid fever is that of a meningitis, in others it is at first that of a pneumonia and at still other times the picture is that of a profound sepsis. Yet we know that these diverse clinical types are expressions of one and the same exciting cause. It may be that the future will show that these pathological states of pregnancy are the expression of different toxic agents. but to-day there is not conclusive evidence that this is the fact. Williams notes the difference in the chemistry of the urine in the two conditions, but our knowledge of that branch of the subject is not yet sufficient to form the basis of conclusions. He likewise notes the difference in the lesions of the liver and other

organs in eclampsia and hyperemesis, and mentions that as another ground for separating the two conditions. But if one compares the histories of Schmorl's three cases (*Arch. f. Gyn.*, 1902) he will find it rather difficult to differentiate the clinical picture given there from that given in cases recently reported by Ewing, Stone and Edgar as cases of hepatic toxemia, and from the first two cases in this article in which the lesion was the zonal necrosis of the liver. And yet Schmorl's cases had the typical pathological findings of eclampsia. I may mention here that we have at this laboratory livers showing the lesion of central necrosis which have come from cases diagnosed clinically as eclampsia.

In our opinion, therefore, whatever theory is advanced or whatever facts are discovered regarding the fundamental condition in eclampsia will have equal bearing on the origin of pernicious vomiting and acute yellow atrophy occurring in pregnancy. This conclusion is not incompatible with the assumption that in typical eclampsia added factors may exist which are not present in pernicious vomiting and acute yellow atrophy, and vice versa.

Bouchard, in his work on "Autointoxication in Disease," gave the impetus to the investigation of the disorders of pregnancy from the standpoint of perverted metabolism. He found that injections of sterile urine were poisonous for animals, and inferred that the poison was due to certain unknown metabolic products. He thought that the urine of the pregnant woman was more toxic than that of the non-pregnant, and that the urine of the eclamptic was more toxic than that of the normal gravida. Hence he concluded that the normal pregnant woman excretes the poisonous substances in a sufficient quantity, but that when they are retained eclampsia is produced. Bouchard's experiments have not been confirmed by later investigators, and the urine has not been found to have the toxicity he claimed for it.

Chambrelent and Tarnier found the toxicity of the urines in their cases diminished, but that of the blood serum increased. Ludwig and Savor confirmed their findings to a certain extent. Volhard denied the toxicity of the serum and the urine of the eclamptic state, but noted an increase in the toxicity of the urine passed after the convulsive period. The toxicity in all these experiments was determined by animal injections.

Schumacher, though not able to confirm Bouchard's results, agrees with him as to the autointoxication, but thinks that

toxicity may be proven by determination of the freezing points of the child's and mother's blood. The results have been contradictory. Heugge, studying the molecular concentration of blood and urine by cryoscopy also came to no important results. The same can be said of König, Schröder and Dienst. Bouffe de St. Blaise and Champetier de Ribes who found necrosis in the liver in a case of hyperemesis accept Bouchard's theory and believe that insufficiency of the hepatic functions, with subsequent intoxication of the whole organism, is the causal factor.

Dirmoser, who has written a monograph on cases of hyperemesis and has had considerable success in their treatment with free catharsis, saline irrigations, and milk diet, finds the source of the intoxication in fermentation and the production of CO_2 in the stomach and the putrefaction of albumens in the intestines. This condition in the alimentary canal, he believes, is produced in pregnancy through the reflex stimulation of the vagus and abdominal sympathetic nerves by the growing uterus. Objection is made to Dirmoser's theory on the grounds first, that it ought to occur oftener because coprostasis is very common in the gravida; second, that, as Pick points out in his cases of hyperemesis, there is no increase of indican as is the rule in putrid autointoxication from the intestines, and third, hyperemesis ought to occur in cases of large pelvic growths where there is a possibility of stimulation of the sympathetics by pressure. Behm, like Dirmoser, believes that the good results in irrigation treatment of hyperemesis point to an intoxication. For him the toxine circulates in the blood and arises at the periphery of the embryonic sac, most probably in the syncytial cells.

Fehling could not confirm Bouchard's findings and first prominently advanced the theory that the intoxication is of fetal origin. The excretory products formed in the growth of the fetus are transferred through the placenta into the mother's blood, and when for some unknown cause they are retained, eclampsia results. Dienst makes some primary weakness of heart or excretory organs responsible for the retention of the fetal products. The poison of these products renders the primary condition worse and then eclampsia and intoxication follow with secondary changes in the viscera. But the findings at autopsies do not always reveal the primary lesions which Dienst presupposes. And, further, it is impossible to explain on Fehling's theory of retention, the cases of eclampsia which

occur after childbirth, unless we assume that the excretory organs of the mother have been injured by the toxins before the puerperium. In fact, Dienst presupposes in every such case that before parturition the liver has been seriously damaged by fetal toxins. A similar assumption must be made in cases where eclampsia or hyperemesis occurs, and finally ceases after the delivery of a dead and macerated fetus.

Another fact difficult of explanation by the theory of fetal poisoning is, as Fehling himself admits, that these conditions affect primiparæ in such a preponderating degree.

Finally, the Fehling hypothesis received a severe blow when Hitschman, 1904, published his case of eclampsia. His patient was eighteen years of age, second pregnancy and four and a half months gravid. The height of the uterus corresponded to a seven months' pregnancy. No heart sounds, no parts of child felt. History of hemorrhages at the beginning of pregnancy. Diagnosis of hydatid mole made. She had two eclamptic seizures and uterus was emptied. No further attack. Uterus contained hydatid cysts, some pea and cherry size, and remains of decidua. No remains of normal placenta and no signs of fetus. The case is unique. Hitschman recognized that his case proves that the fetus is not the cause of eclampsia, and thinks Veit's theory a distinct advance, since it makes the ovum membranes the site of toxin production.

Another line of investigation in seeking for the toxic agent has been followed in recent years by those who hope to demonstrate its presence by the study of cytotoxins. It has been known for some time that cellular elements of the placenta and decidua are to be found in the heart, blood and lungs of eclamptics, and Schmorl first advanced the idea that perhaps their destruction gives rise to some coagulating substance which under favorable circumstances causes the thrombosis which he always found in autopsies upon cases of eclampsia. He had to abandon his theory when it was shown that placental cells are often present in the blood and organs of normal pregnant women. He was unable to produce thrombosis in animals by injection of placental tissue.

Veit argued that since syncytial cells from chorionic villi circulate in the maternal blood that they probably cause the formation of a substance capable of destroying them. By injecting placental tissue into rabbits he obtained a serum which contained an agent capable of dissolving syncytial cells. This

he called syncytiolysin. He therefore supposed that eclampsia is a toxic condition brought about by direct poisoning through an acute deportation of placental elements into the circulation in such manner that the syncytiolysin cannot destroy them.

Schmorl in experimenting along the line of Veit took heart's blood from a case of eclampsia just dead, kept it in sealed test-tubes at 0° C., and then mixed the serum with fresh human placental cells. The mixture he kept in test-tubes and under the microscope for two days at 37° C. It remained sterile but showed no action of the serum on the placental cells, *i. e.*, no syncytiolysis, nor even hemolysis of the blood cells present. He does not think his experiment conclusive because he did not use the blood from the living, and yet it bears strongly against Veit's hypothesis.

Ascoli first obtained a rabbit serum which was syncytiolytic for guinea-pig placenta, then he injected it subcutaneously into pregnant pigs without result. When he injected it in the subdural space the pigs had eclamptic-like convulsions and died. From these experiments he deduced the theory that it was not, as Veit supposed, the superabundance of placental cells which caused eclampsia, but the sudden excess of syncytiolysin, free and not neutralized.

The next work of importance along this line is that of Weichardt, who, by injection of human placenta into rabbits obtained a cytotoxin which dissolved placental cells. Next he took placental cells and allowed such a specific toxin to act upon them and then injected the mixture into female rabbits. Three died after severe clonic and tonic convulsions and showed the complete anatomical findings of eclampsia, such as extensive hemorrhagic and anemic necrosis in the liver, thrombosis in veins and capillaries and cloudy swelling in kidneys. Six were unaffected by the injections.

Weichardt's interpretation of his results is as follows: In syncytiolysis, that is, a solution of transported placental elements, proteids are derived (syncytiotoxins) which are poisonous for the mother. In the normal pregnancy enough antitoxin is formed to neutralize the toxin, but when the formation of antitoxin remains wholly or partly insufficient, eclampsia results.

Wormser, 1904, reviewed the work of Veit, Ascoli, and Weichardt. He could not demonstrate syncytiolysis *in vitro*. He found that when he tried Ascoli's experiment the brain was easily injured and he thinks this accounts for the convulsions.

He further thinks it but natural that when one injects a powerful serum underneath the dura one ought to expect some reaction, and he rightly, I think, considers that a serum as powerfully toxic as Ascoli's should have a toxic effect on the brain cortex when injected intravenously. He repeated Weichardt's experiment on five animals and they remained healthy. He called attention to the fact that Weichardt obtained a positive result in only three out of eight animals, but he admits that the autopsy findings of eclampsia are of considerable significance.

Finally mention must be made of Dienst's (1905) latest theory of eclampsia which is based on the assumption that the maternal and child's blood become mixed through the breaking off of the placental villi. In the blood of an eclamptic there are antibodies which cause the agglutination and hemolysis of the fetal blood cells and discharge of their hemoglobin; this latter process causes widespread coagulation with the result that swollen vessels are thrombosed. Thus eclampsia arises and a clinical picture similar to that produced when a foreign blood is transfused into an animal. Unfortunately for this theory, it appears to be based upon false premises. Liepmann points out that a communication between the maternal and child's blood has not been proven; that he himself has not found any hemolysin or hemagglutinin in eclamptic blood, and lastly, that transfusion has not produced a clinical picture in which there are severe tonic convulsions of considerable duration nor yet the pathognomonic liver necrosis. Flexner describes the liver of an eclamptic in which he found hyaline thrombi and suggested they were due to hemagglutinins. Pearce has since experimentally produced necrosis in the liver of dogs and rabbits by the injection of both hemagglutinins and bacterial agglutinins.

Although the results of experiment along the line of intoxication through fetal cell elements has not thus far proved altogether satisfactory, yet they certainly indicate that investigation in that direction may not in the end be devoid of result. Certainly the tolerance that in a measure seems to exist in those who have once had eclampsia would appear easiest of explanation on the assumption of cytotoxine, as would likewise the fact that primiparae are most often the victims of these abnormal conditions.

Attempts have been made to throw some light on the nature of the intoxication in cases of eclampsia by a chemical study of the urine and the blood, but thus far the efforts in this direction

have not yielded very satisfactory results. However, they all point toward some interference with the nitrogenous metabolism of the body, and from the nature of the lesion found in the liver, this is not surprising.

Erwin Voit early found no urea in the liver and muscles of eclamptics. Gscheidlen noted a marked increase in the urea of the blood. Butte, however, found that the blood of normal gravida contained more urea than that of one suffering from a severe or fatal eclampsia. His explanation was that the urea producing function of the liver was interfered with in the latter. His method included the NH_3 and amido-acids with the urea. Poehl measured the relation of urea to the total nitrogen content of the urine and concluded that there must be a lessened oxidation going on in the body of the eclamptic. He found also a marked increase of the leucomains in the urine. Zangemeister noted that in a normal pregnancy the quantity of NH_3 in the urine was relatively lessened although the quantity of urine was increased. The total quantity remained unchanged. At the beginning of labor the urine increases and the NH_3 relatively diminishes, until after birth, when they both increase. He did not find that the presence of albumin influenced the excretion of NH_3 . His conclusion was that since in eclampsia there is a diminution in the quantity of urine without a corresponding increase in the excretion of NH_3 , there must either be a lessened production of NH_3 , or else it is retained in the blood.

Zweifel, 1904, has made the most recent and exhaustive chemical investigation of eclampsia. He found that the percentage of urea nitrogen in an eclamptic urine is markedly diminished; that the greater the quantity of albumin, the less that of urea, and that when in the course of the disease the albumin diminishes the percentage of urea increases.

The ammonia nitrogen was uniformly high, reaching 14 per cent. in one case, and diminished with the improvement of the patient. The proportion of the neutral sulphur to the total sulphur was increased especially in severer cases, and he regards the determination of the sulphur partitions of the urine as a more reliable index of the oxidative capacity of the organism than is the estimation of nitrogen partitions. In the blood he found no increase and therefore no retention of urea to account for the diminution in the urine. He found no increase of ammonia in the blood, but on the contrary a decrease during the convulsive seizures, results which speak against the theory of

ammoniemia and in favor of an acid intoxication. His general conclusion from the study of the urea, ammonia, and sulphur of the blood and urine, was that eclampsia is essentially a "riesiges" diminution of the oxidative capacity of the organism, leading to a state of acid intoxication. From theoretical considerations and the demonstration of lactic acid in the urine of a fatal case of eclampsia, he suggests that lactic acid is the poisonous agent in the intoxication.

At the present time the data seem too meager to determine whether the toxemia of eclampsia is caused by faulty oxidation of nitrogenous bodies through functional insufficiency of the liver, or whether this perverted metabolism is caused primarily by some toxic substance derived from the genital tract. Unfortunately, very little has been done in the examination of the blood and urine of the cases of the pernicious vomiting of pregnancy, and those fatal cases which clinically approach the picture of acute yellow atrophy. As mentioned, Behm offers the hypothesis of a toxin derived from the cells of the egg membranes, but does not present experimental evidence. Autointoxication from Bouchard's standpoint has been discussed and St. Blaise's case of hyperemesis led him to consider the liver at fault in the intoxication. Ewing, examining the urine of some cases of pernicious vomiting and cases simulating acute yellow atrophy, was impressed with the general low percentage of urea nitrogen and the presence of amido-acids. Albuminuria, as has long been known, he found to be very variable in occurrence. He considers such constitution of the urine to indicate deficient oxidation of proteid derivatives, and not only regards these cases as toxic, but considers the toxemia as due primarily to functional disturbance of the liver. His ground for regarding the liver as primarily responsible is because the synthesis of urea is chiefly a function of the liver. Edgar in the cases of pernicious vomiting and hepatic toxemia reports the varying presence of leucin and tyrosin, varying quantities of urea, albumin sometimes present or absent, and in one case a marked quantity of acetone and diacetic acid as in an acid intoxication. Williams states that he found a marked increase in the percentage of NH_3 excreted in the urine. He found that whereas the NH_3 nitrogen normally is between 3 and 5 per cent., in his cases it rose to between 16 and 32 per cent., or even 42 per cent. He considers whether the increased NH_3 is due to the marked destruction of liver tissue interfering with the normal oxidation of

nitrogenous material into urea, or is an attempt to neutralize an excessive production of acid—an acid intoxication. But so far no extensive and thorough chemical analyses of the urine and blood of this class of cases, such as Zweifel made in eclampsia, have been carried through, without which there is very little use in speculating on the significance of these findings.

The character of the lesion found in cases of eclampsia and hyperemesis gravidarum also furnishes evidence pointing to the toxic nature of these conditions. In eclampsia the typical lesions as described by Schmorl are, first, small necroses occurring typically at the periphery of the lobule; second, necrosis in sector form cutting into the lobule; third, deposition of fibrin always accompanies the hemorrhagic and anemic necrosis; fourth, thromboses into the smallest intra- and interlobular branches of the portal vein and capillaries and (more rarely) in the smallest arteries. Appearances similar to these have been found in only two conditions: embolic closure of a small portal vein following ligature of omentum and in a case of parietal thrombus of splenic vein. In addition to the lesion described in the liver, thrombi occur in the lungs, and in the small vessels of the brain, resulting in softening and hemorrhages. In the heart there is fatty and parenchymatous degeneration of the muscle fibers, hemorrhage, necrosis and rarely thrombosis in the walls. In the kidney, degeneration of the epithelium.

According to Schmorl, the processes are thrombosis, necrosis, and degeneration. A thrombosis as widespread and extensive in its distribution as is here described can only arise from the formation within the circulation of fibrin ferment from the destruction of blood cells by means of some toxic agent or from an intoxication of the blood through the accession of some fibrin ferment-like substance arising from necrotic cells or disintegrated tissue outside the blood vessels, or, lastly, by the entrance into the circulation from without the body of a poison related to fibrin ferment. An increase in the fibrinogen of the blood has been demonstrated in pregnancy, and in eclampsia we must presuppose a still further increase of the fibrin ferment in order to account for the extensive thrombosis, and the most plausible cause of the three we have mentioned is the formation of fibrinogen from the destruction of blood cells and injury of capillary walls by some toxin. The formation of fibrin ferment depends partly upon the destruction of white blood cells. In order, then, to account for the increased fibrin content of the blood of an

eclamptic we must assume a hyperleucocytosis. An increase in the number of leucocytes in an eclamptic in comparison to the normal pregnant woman has been noted by a number of observers, among whom are Lubarsch, Dienst, and Kollman. Volhard found in two of his eclampsia cases that the urine had a coagulating power, and produced intravenous thrombi by injection.

The recent work of Doyon and others has added an element of perplexity to the explanation of thrombosis in eclampsia. They find experimentally that the liver is the site of production of fibrinogen, and that when it is removed or injured by hemorrhage the blood loses the power to coagulate. Further research is necessary to elucidate the apparent contradiction between this experimental result and the findings in eclampsia where the liver is so much affected in the pathological process.

The only pathological condition in which the liver is at all similar to that described by Schmorl is sepsis. Some of Schmorl's cases were studied with the object of demonstrating bacterial infection, but with negative result. Others have likewise made the attempt and have found bacteria, but this work has failed to stand the test of scientific criticism.

The character of the lesion in our cases and in others of central necrosis is also evidence of the action of toxins. Mallory thinks that central necrosis is due to diffusion of some strong toxin. He does not consider that bacteria can cause this lesion, though their toxins may. He likewise produced the lesion in a rabbit by injecting a dose of diphtheria toxin sufficient to kill in three days. He found the muscles of the entire body the seat of intense fatty degeneration and the center of every lobule was necrotic. This experiment is important as pointing toward the toxemic nature of the lesion.

Opie regards the toxin of intense bacterial infection as the most important etiological factor in zonal necrosis in his cases.

Symptomatology.—An exhaustive discussion of all the symptoms which are characteristic of the toxemia of pregnancy falls outside the scope of this paper. It is our desire simply to call attention to the more important manifestations and consider their bearing upon diagnosis and treatment.

Disorders of the nervous system cannot be said to be a rare occurrence in pregnancy. Both the brain and the peripheral nerves are affected. The mental symptoms range in degree from restlessness, languor, and perversion of the senses, to melan-

cholia and mania. Statistics show that from 14 to 15 per cent. of the women in asylums suffer from a psychosis which developed during pregnancy, puerperium, or lactation. Of these it is estimated that the psychosis in from 2 to 3 per cent. developed during pregnancy. States of depression are not at all uncommon in the early months, and especially in primiparæ. They are especially marked in those who are at the same time troubled with vomiting, and they tend to become deeper as the physical condition of the patient grows worse. As is well known, the altered mental state sometimes develops into a maniacal psychosis, but as a rule in the early months the character of the psychosis is of the depressive type. In Case III of our series the patient was melancholic in the third month of her first pregnancy. In another case of fatal hepatic toxemia which came to my notice, the patient wrote letters to her husband three weeks before the labor, telling him she expected to die, thus showing the melancholic state of mind she was in at the time. Kraepelin says in his sixth edition that he was wont to regard the severe psychoses of pregnancy as exhaustion psychoses, but that he has come to consider them rather as due to autointoxication.

We also find the toxemic origin to be the most rational explanation of these states of pregnancy. Certainly there is no other origin for the neuritis which sometimes develops in pregnancy. The cause being acknowledged as toxic, no matter of what nature, and the toxemia being primarily due to the state of pregnancy, the question arises, what steps are to be taken to relieve the mental condition?

It would seem that the most natural plan to pursue would be to terminate the pregnancy when the psychical state develops into melancholia or mania. But writers on obstetrics and even Kraepelin advise against this procedure, on the ground that the psychosis remains and runs its course. This is a standpoint which is rather difficult of comprehension. If the cause of the nervous disorder were some organic poison, or if the autointoxication arose from intestinal putrefaction, or even post-partum endometritis, there would be no one who would not advocate the removal of the source of the noxious substance. Even though it were true that the melancholia of pregnancy does recover in 90 per cent. of the cases, who can tell what had been the fate of the other 10 per cent. had the source of the toxemia or its primary cause been removed? There are not enough observations on the effect of the termination of pregnancy after

the psychosis is developed to prove what effect such an operation would have on the duration of the abnormal mental state.

The cases of vomiting of pregnancy are usually classified as reflex, neurotic and pernicious. The cases in which the emesis is due to some reflex stimulation of the vomiting center are reported as having as the primary stimulus one of the following conditions: disease of the uterus and adnexa, malposition, chronic inflammatory process of the cervix, chronic inflammation in the pelvic cavity, such as formation of connective tissue, laceration of the cervix, too marked dilatation of the uterus, as by hydramnion or twins. When one looks over this list carefully he cannot help being impressed with the absurdity of considering some of them as causes of even the mild vomiting of pregnancy, and yet they have all been advanced as causes for even the serious cases of emesis. Is there anything more unscientific and irrational than to suppose that lacerations of the cervix cause pernicious vomiting, or any of the other conditions mentioned except possibly malposition of the uterus? If those conditions, twins and hydramnion excluded, can cause marked vomiting during pregnancy, they ought to do likewise in the non-pregnant state. But we are told that the reason they are factors of importance during the gravidity is because at such a time the female nervous system is in a highly irritable condition and requires only the slightest stimulation to produce a reflex outburst. Yet in textbooks on nervous diseases under the heading neurasthenia, and in works on gynecology, under the nervous disorders of women, one finds all those pathological states enumerated above set down as in themselves the cause of the heightened nervous irritability of the woman. And yet there is no record of these highly nervous individuals suffering from excessive vomiting or dying of pernicious vomiting. Dilatation of the cervix did not stop the vomiting in Case II. In the one instance that is, in the non-pregnant woman, these pathological conditions cause the increased irritability of the nervous system resulting in neurasthenia and hysteria and, as was once taught, even in psychoses, whereas on the other hand the nervous irritability being present because of the gravidity, they cause hyperemesis gravidarum and the other serious states mentioned. One must admit that occasionally the vomiting of early pregnancy has stopped after a malposition of the uterus has been corrected, but even in those cases it is a question whether or not there may not have been some slight intoxica-

tion present. The growing uterus has been held responsible for the vomiting, but rapidly growing tumors do not cause such symptoms.

The heightened irritability of the nervous system upon which the adherents of the reflex theory so strongly rely undoubtedly is present in many pregnant women, but its very presence is in our opinion an evidence of a toxic state either developed or impending. All the cases of toxemia which we have studied showed as an early symptom a marked restlessness and intolerance of stimuli, and this state in its further development gradually evolved into delirium and even mania with hallucinations. Hence we are inclined to regard this nervous sensitiveness as in itself a symptom and an effect and not a cause in the development of the conditions we are discussing.

The neurotic theory of vomiting received its impetus from Kaltenbach who regards hyperemesis as a purely functional neurosis in which reflex irritability is increased and reflex inhibition diminished, but in which, as in hysteria, the energy devoted to reflex inhibition along certain lines can be recovered suddenly through certain psychical stimuli. He goes so far as to state that "even in fatal cases no constant or serious lesion is proven to exist in any organ," that the condition was termed "allgemeine marasmus." He explained the lethal ending by supposing that through inanition the life activities of the cells reach a certain minimum point where, even though vomiting cease and food be taken, death cannot be prevented. Evidently he must to a large degree have based his assumption of the functional character of the vomiting upon a lack of knowledge of the pathological lesions of the condition. It is strange how he could conceive of a patient with a merely functional trouble vomiting continuously, emaciating and finally dying of starvation. Hysterical patients do not become emaciated and starved.

Williams in his recent article thinks that Kaltenbach's view is extreme, but that in many cases the vomiting appears to be neurotic. He considers this assumption necessary in explaining cases where a rapid cure has followed the prompt employment of means which were suggestive and not physiological. I recall a discussion at a meeting of an obstetrical society where a specialist related the case of a young woman who was suffering from the uncontrollable vomiting of pregnancy, but when holy water was given to her to drink, she, being a Catholic, retained

it. The case was cited as an instance of the neurotic character of the condition. However, the holy water was not sufficient to sustain life, and she died. From the description of the case it was undoubtedly one of hepatic toxemia. This is an example of many of the instances reported in the literature to prove that persistent vomiting is due to a neurosis.

One must, however, admit that there are cases in pregnancy, especially in the early months, which have the appearance of being neurotic, and which yield to measures adapted to the treatment of such a condition. Some of these cases may be due to worry, anxiety, or merely nervousness, causing an impairment of digestion with consequent autointoxication from the intestines. These are cases of vomiting in which there is an excess of indican in the urine. I feel, however, that in most instances the cause of such a neurotic state is largely due to the fixity with which the idea that it is "physiological" and natural to have nausea and vomiting in the early months of pregnancy is rooted in both the medical and the lay mind. The result is that every young girl who is suspected of being pregnant is asked by her mother and the physician firstly, has she menstruated, and secondly, whether she feels sick in the morning and if she has vomited. Now, given a highly sensitive, neurotic girl, and suggest to her constantly that nausea and even vomiting are a sort of *sine qua non* of the early months of pregnancy and it is not surprising if she accommodates friends and physician. Nor is it surprising if because of the increased activity of her metabolism at such a period and the slight feeling of discomfort in the abdomen aroused possibly by the congestion of the genital organs and disturbance of visceral relations, she should be more sensitive than usual and have a tendency toward lack of control of her impulses—hysterical, if you will, and having commenced to vomit should continue until stopped by some powerful psychical shock or suggestion.

No harm can result from regarding some of the mild cases of vomiting as neurotic, provided the possibility of its being due to a more serious condition is always kept clearly before the mind, and provided the diagnosis of it as such is not made until all other possibilities have been excluded. The danger lies in the deeply rooted conception that there is a form of vomiting which is "physiological," and which, as I have said, is not only shared by the physicians but also by the lay person. Vomiting is never a physiological process. When it occurs in preg-

nancy it is the expression of some pathological state, whether neurotic or toxemic. It ought never to be lightly regarded, and probably would not be were it not for the teaching which makes it the natural accompaniment of the early months of pregnancy. It is sometimes stated that its frequency and relative harmlessness prove that it is not a serious malady. But is it as frequent as is generally thought? We have observed a number of primiparæ who may have had slight nausea but who had no vomiting during their entire pregnancy. In discussing this subject recently with a specialist in obstetrics I asked him to look over his records for the cases of primiparæ who had suffered from vomiting, and he was surprised at the small number of cases who had had emesis, and the few who had even suffered from nausea. Even among those few cases, I feel sure that had they been looked for other symptoms pointing toward a certain degree of toxemia would have been found.

The diagnosis of neurotic vomiting ought never to be made until the physician is satisfied, or better yet, absolutely convinced, that the patient is not suffering from a toxemic state. In fact we feel that for the general welfare of the gravid woman the sooner the idea becomes widespread and universal that the vomiting of pregnancy is not a necessary evil but a dangerous and threatening one, the fewer fatalities will be recorded, and, too, with less discredit to ourselves as physicians.

When the cases of vomiting in pregnancy present the clinical picture seen in our cases their recognition is not difficult. More difficult of appreciation are the acute cases such as that reported by Stone. Yet in all of them the constant unremitting vomiting, the restlessness or somnolence, the headache and the pain in the epigastrium, are enough to warrant the physician assuming active steps to remedy the condition, and, failing in this, to terminate the pregnancy.

Vomiting in the latter months of pregnancy is a much more serious state and ought always to be suspected as of a toxemic nature. It may then be the precursor of eclampsia or of those dreaded conditions which are allied to acute yellow atrophy of the liver and which indeed, as in our cases, may evolve into that very state.

Furthermore, it were better if the laity did not regard the pregnant state with quite so much indifference. The medical profession is to blame for this lay attitude because they do not urge strenuously enough the need of constant medical super-

vision. Nothing shows the indifference of the physician to the dangers of pregnancy so much as the careless way in which the urine is examined in pregnancy. To-day, according to our present knowledge of the subject, the best indication we have as to the seriousness of the toxic symptoms is found in the urine. Most physicians are satisfied with one or two examinations for albumin, although they ought to be perfectly well aware of the fact that albumin is often absent in the severest toxemic states, even in eclampsia. The urine has to be examined for the urea output in the twenty-four hours, for the total nitrogen excretion, for the amount of NH_3 excreted and the proportion it bears to the total nitrogen, for leucin and tyrosin, chemically for acetone and diacetic acid and for the sulphates. Such an examination cannot be properly done by the ordinary physician, but requires the services of a chemist. I do not mean to urge that the exhaustive examination is necessary in every case of pregnancy, but when there are symptoms pointing to the toxemic state then a chemical knowledge of the urine is highly necessary. We cannot state as yet which factor or what group of factors is of importance as found in the urine. Leucin and tyrosin are present in some of the serious cases of toxemia and have also been found in other pathological states. The amount of urea and albumin vary within broad limits as we have pointed out in the discussion on etiology.

The amount of NH_3 which gives an indication of a dangerous disturbance in proteid metabolism is unknown. Williams considers 10 per cent. the danger point, but Stone in a recent article reports four cases of pernicious vomiting and three of the preeclamptic type in which the ammonia nitrogen was increased in only one case, and concludes that it cannot be considered as an index of the severity of the toxic process. Since the ammonia nitrogen of the urine is a very variable quantity, and since the significance of a high proportion of ammonia nitrogen depends largely upon the diet, and since Folin reports more than 10 per cent. of ammonia nitrogen in several normal urines, it seems unlikely that variations in this element can safely be made the basis of prognosis and treatment. Stone regards the determination of the nitrogen partitions as a very efficient means of detecting the seriousness of the condition. The best deduction that can be made from the urinary examination is that when one or more of these factors are present in association with previous clinical manifestations of toxemia, the termina-

tion of the pregnancy is advisable if the measures employed in elimination of the toxic substance are not quickly effectual. When such a step is advisable the wishes of the relatives and the patient herself and the desire for offspring are to be disregarded and the possibilities of the continuance of the pregnancy clearly set forth to all concerned.

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THE ETIOLOGY OF CANCER OF THE PELVIC ORGANS.*

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ONE cannot intelligently enter into a discussion of the etiology of cancer of the pelvic organs, without at the same time entering into the subject in a broader sense and discussing the etiology of cancer in general, and here the discussion could be brought to an abrupt end, at the outset, by borrowing a sentence recently used by one of the most prominent pathologists in Germany, in

*Read before the New York Obstetrical Society.

his opening remarks in a similar discussion before the Berlin Medical Society. The first sentence read: "What do we know of the causes of malignant growths?" The next sentence was: "We know nothing as yet of the causes of malignant growths." The speaker was Prof. v. Hanseemann. But, as in that society a lively and interesting discussion followed this nihilistic opening, so I hope that here to-night a profitable discussion will follow my paper, though it makes no pretense to offer anything more than a brief résumé of the existing theories regarding the causation of cancer, and to present, not without considerable diffidence, a thought relative to the causation of cancer of the uterus, that has occurred to me during my activity in public practice.

The theory at the present, about which centers the most discussion, as you all know, is that which ascribes the disease to a parasite. It is interesting, and perhaps not without instruction, to note that the most ardent advocates of this theory are men whom we must designate as clinicians, as for instance, v. Leyden, Czerny, Leopold, Olshausen, Behla and others; while on the other hand, the opponents of this theory are the true pathologists, as for instance, v. Hanseemann, Orth, Pick, Israel and others.

The arguments and evidence that the advocates of the parasitic theory bring forth may briefly be stated as follows:

(1) Such able observers and clinicians as Sydenham and Van Swieten believed in the infectious nature of cancer, as do very many able clinicians of the present day.

(2) The clinical picture of the disease, which is as if the individual attacked were eaten up and destroyed by a parasite.

(3) The occurrence of cancer in endemics, as has been observed by several reliable authorities. R. Behla, for instance, in a small village with a population of 1,200, in Switzerland, made autopsies on 9 cases of cancer in 1902; and in another village (Lier) in Norway, with a population of 900, he made autopsies in 7 cases of cancer in 1901. Several other instances of a similar nature are to be found in the literature. Here I may be allowed to digress to say that R. Behla, who has made an especial study of cancer localities, says that they occur usually in swampy places, where the soil consists of white clay, and where the rivers are bordered by rich vegetation. He believes that the parasite is carried by the leaves floating on the water.

In the same category must be mentioned what are called

in Germany, "cancer houses," that is, houses in which cancer has developed in one or more members of the families that have occupied them consecutively. He who is interested in this subject may be referred to Behla's article in the *Berliner medizinische Klinik*, No. 34, 1905.

Here may also be mentioned the instances of cancer à deux—that is, where man and wife have contracted the disease within a short time of each other. C. Posner, in an article in the *Zeit. für Krebsforschung*, Bd. I, 1904, analyzes the report of the Berlin Committee on the Investigation of Cancer. They collected 2,330 cases of cancer of the female genitals, and 107 cases of cancer of the male genitals. Of these, in 38 cases in women and 4 cases in men, the suspicion was very strong that the disease was caused by contagion through marital relations. It is proper to add, however, that in all of these cases the disease did not occur in the genitals in both man and wife. Behla, for example, reports an instance in which the wife had cancer of the uterus and the husband cancer of the kidney. Berger, where the husband had cancer of the penis and the wife cancer of the ear. On a closer analysis of the foregoing statistics, out of 773 cases of cancer of the cervix, in 11 cases there was a strong suspicion that the disease was contracted from the husband.

I have dwelt at some length upon the evidence adduced of cancer being transmissible from husband to wife or vice versa. While the evidence in some of the cases must be conceded to be fairly convincing, that of the majority will not bear close scrutiny. The evidence, to carry any weight, must give full details, and must furnish instances where the genitals of both the husband and wife were affected. It must occur to everyone that with the great prevalence of cancer of the cervix, and with the disease only too often not being detected until very far advanced, and that with cohabitation, in consequence, taking place frequently during that fairly long period from the onset of the disease until its detection, cancer of the male genitals ought to be more common than it is. We are, consequently, not justified, in my opinion, as yet, in accepting the cases of cancer à deux that are based on strong evidence, as anything more than examples of strange coincidences.

A fourth evidence brought forth by the advocates of the parasitic theory is what is called "contact cancer"—that is, overlapping surfaces becoming affected with the disease. Such cases are not infrequent.

(5) The evidence furnished by the metastatic growths, presenting thus a resemblance to tuberculosis.

(6) The positive inoculation experiments from one animal to another.

(7) The occurrence of epidemics of cancer among the lower animals, as in mice, guinea-pigs and dogs.

The pathologists, for such we must designate the opponents of the parasitic theory, say to all this: First, we do not accept your assumption that cancer is on the increase. You ignore the fact that more people nowadays reach the ages of 30 and 40 than did formerly, and that that age *par excellence* is the one in which cancer is most likely to develop. Another fact you seem to lose sight of, is that the diagnosis of the disease is more highly developed and more cases are detected than formerly. But, for fear that you may infer from this statement that we think your diagnostic acumen is perfect now, we will quote to you the figures of our pathological institutes. Of the cases coming to autopsy, in which a careful clinical diagnosis had been made prior to death, 20 per cent. dying from cancer had not been diagnosed during life. (v. Hansemann, in Berlin; Heller, in Kiel; Bollinger, in München.) J. Orth analyzes the figures of the Berlin Pathological Institute for the past two years. There were 1,655 autopsies on persons over 25 years of age; 249, or 15 per cent. of these, were cases of cancer; that is, where it was the cause of death, and still 13.5 per cent. of the cases were not diagnosed during life.

Bovis, who has made a careful study of this subject, finds that cancer of the external organs, as the skin, breasts and uterus, has not increased, but if anything has decreased, and that cancer of the internal organs has increased; but this increase he attributes to better diagnostic skill.

V. Hansemann quotes the observations of several authorities to show that endemics of cancer occur also among the lower animals, but these endemics have always affected the same organ, as, for instance, in one endemic the vulva, in another the skin glands, and in a third the canthus of the eye were affected. These instances, he holds, argue against infection; they point rather to heredity or to some external causes, the nature of which has so far escaped our knowledge.

Orth, and I may add all pathologists, assert that the experiments with positive results of transmission of cancer from

one animal to another animal of the same species, has no bearing whatever on the infectious nature of the disease; they are merely instances of transplantation of the cancer cell. In all of the experiments the cancer tissue, divided up into minute fragments and rubbed up into a liquid, was inoculated and the inoculated material always contained the cancer cell, which possesses the inherent property of reproducing itself, and further possesses the property of maintaining its original characteristics in its new soil. The new growth is made up of a proliferation of the inoculated cancer cell, and its growth simply pushes aside the cells of the tissue among which it grows, so that the cells of the host take no part in the new growth.

V. Hansemann says that it can be positively asserted that, up to the present day, all attempts to inoculate the cancer of man upon the lower animals have failed. He himself has tried it several times, even with the aid of an intermediate host, as fish, worms and flies, but always with negative results. The experiments of Dogonets and Gaylord, he holds, are based on error. The growths they produced were not cancer; they were merely of an inflammatory nature. Even granting that Gaylord found true cancer of the liver in the dogs he experimented upon, v. Hansemann asserts there is no trustworthy evidence that it was produced by the inoculations, for, as is well known, dogs are very prone to cancer of the liver, and the find was, doubtless, a mere coincidence.

How different is the case with true infections, as tuberculosis and suppurative infection. Take a pus cell and deprive it of its active bacteria and inoculate it into an animal; the result will be negative. On the other hand, if you separate the bacteria from a pus cell and inoculate them into an animal, they set up an active process in the cells of the tissue or organ into which they are introduced. The same thing applies to tuberculosis. The cheesy products of tuberculosis, when deprived of the tubercle bacilli, are simply innocuous, and as in active suppuration, so in tuberculosis, the cell as a cell takes no part in the infection.

Practically, the evidence based on metastatic growths can be met in the same way. In cancer the secondary growths are produced by a transmission of the cancer cell along the blood or lymph current, and where the cancer cell is deposited it continues to grow, independent of the tissues of its new host. It produces a growth similar in all respects to the original growth

from which it sprang. For instance, when a secondary deposit occurs in the liver, in growing it crowds and pushes the liver cells to one side, and in this way ultimately destroys them, but the secondary growth corresponds in all respects to the original growth. That is an entirely different affair from what occurs in the secondary affections in tuberculosis and infectious processes.

As a crushing rejoinder to the advocates of the parasitic theory v. Hanseemann remarks that he has had many objects shown to him as the parasite of cancer, but that these had almost every characteristic but that of a parasite. He adds that he is forced to say that those who have hitherto announced the existence of a parasite in cancer do not understand anything of parasites, or don't know anything of cancer or do not understand anything of either. He concludes by saying that he does not feel the logical necessity of a parasite as a cause of cancer, but that he holds himself open to conviction when the true parasite is demonstrated to him.

The advocates of the parasitic theory have great persistence and vitality and show enough life even after these crushing blows to cry out, What about the parasites of malaria and the sleeping sickness? Have you ever been able to separate them from the cell, to grow upon a culture medium and inoculate them into another animal? Still you admit that they are true parasites and are the etiological agents of the respective diseases.

Before leaving the subject of the cancer cell and its possible parasite I wish to draw attention to some very interesting observations made by Dr. Wolff and Messrs. Blumenthal and Bergell in the Institute for Cancer Research, under the supervision of v. Leyden. These investigators directed their attention to the chemicophysical properties of the cancer cell. They found that the cancer cell differs from the epithelial cell, (1) that the black pigment in melanotic cancer is different from the pigment in the normal human individual; (2) that the relation of the albumose to the albumin products differs from their normal proportions; (3) that the cells of cancer are more easily destroyed than epithelial cells—that is, they are more easily dissolved by the digestive juices; but in this there is a difference, pepsin affects them less, while pancreatin and trypsin dissolve them more quickly. Finally Blumenthal found a ferment in the cancer cell which has the characteristic of not only auto-

lytically dissolving the albumin and the substance of its own cell, but possesses this power over all cells of the body. Now the normal cell contains also a ferment, but it has the property only of being able to dissolve the albumin of its own cell. This is a very interesting discovery and may be a step toward fulfilling the anticipations of many deep thinkers who hold that the problem of the causation of cancer will be solved by chemico-physical researches.

Let us next consider hereditary influences. There seems to be a pretty general consensus of opinion that heredity does play a role in the causation of cancer. The different statistics vary somewhat, but the ratio ranges from 20 per cent. to 30 per cent. Every one of us has come across families several members of which have been the victims of cancer.

V. Hanseemann says there is no evidence of a direct hereditary influence, but that he cannot deny the inheritance of a disposition to cancer. Still, he says it need never be feared in the same way as the inheritance of the predisposition to tuberculosis. An exception to this, however, is xeroderma pigmentosa.

Max Schüller, in a recent article in the *Archiv. für Rassen u. Gesellschaft Biologie*, Bd. I, 1904, relates some interesting facts regarding racial predisposition to cancer. He states that all statistics of countries where the inhabitants are composed of natives and emigrants show that the emigrants possess a much greater predisposition to cancer than the original inhabitants. He gives the figures of the mortality from cancer in the various European countries. The percentage in 100,000 living persons is as follows:

England and Wales.	67.6%
Scotland.	81.0%
Ireland.	65.0%
Germany.	72.7%
France (cities).	104.0%
Austria.	70.4%
Hungary.	32.8%
Italy.	52.1%
Switzerland.	132.0%
Holland.	91.3%
Norway.	84.5%
Sweden.	102.0%

I have purposely left one of the most important etiological factors for the last, and that is traumatism. But by this I do not mean acute or gross traumatism, which by some is held capable of starting a cancerous growth, but traumatism in its broadest sense, the chronic form, or what might be termed as continuous or almost continuous irritation. Chronic irritation as a cause of cancer has been recognized for a long time. The old theory of Virchow to which v. Hansemann says he still must give adherence, was based upon the interchange of action between the irritant and irritability of the tissues. The irritability of human tissues is variable and v. Hansemann says he can think of persons in whom a slight irritation might result in the production of cancer.

The development of cancer in old cicatrized tissues is not an uncommon occurrence. This tendency is of especial interest to us as gynecologists who are daily brought into contact with cicatrized tissues that are exposed to considerable irritation. I will not enter into the question of laceration of the cervix as a cause of the development of cancer excepting from the negative side. I expect the positive side will be fully brought out in the discussion that is to follow. I will also leave to others the question of the irritation consequent upon benign growths of the uterus as a cause of cancer of the uterus.

What I desire to draw your attention to particularly is the result of my experiences in dispensary practice among a class of women in whom *a priori* we would expect cancer of the cervix of common occurrence. W. Japp Sinclair in his masterly address before the British Medical Association in 1902 ended an iconoclastic review of the existing theories of the causation of cancer by the following statements, which I will quote in full:

"Cancer of the cervix uteri occurs almost exclusively among the poor, the chronically overworked and underfed, among women poor, prolific, harassed, worried, drained by lactation. That fissures of the cervix, neglected lacerations, tissue changes in the cervix from flexions, irritations from venereal diseases, remnants of puerperal sepsis affecting the cervix, enter into the causation of cancer, I have myself no doubt whatever. There is no time to argue the question, but each expression here used embodies an opinion and has the foundation of a thesis which I am prepared to maintain and defend."

Now the class of women that visit Mt. Sinai dispensary fulfill these conditions in every detail, still cancer of the cervix

is exceedingly rare among them. I was struck with this fact within a short time after I began my service, consequently I paid especial attention to every case that presented the slightest suspicion. A portion of the cervix was excised and sent to the hospital pathologist for microscopic examination. In no case where I was not already certain that the disease was unmistakably cancer did the pathologist report a positive finding. In other words, the cases that were merely suspicious clinically proved microscopically to be instances of chronic endocervicitis. These cases were always kept under observation for a long time, and the correctness of the pathologist's report verified by the subsequent developments. It is no more than fair to add that in not a single instance was the pathologist's report found to be incorrect by the subsequent clinical course.

For the purposes of this paper Dr. I. Seff kindly examined very carefully the records of my service from 1893, when I took charge, up to the present time, a period of thirteen years. During this period there were in all 19,800 new patients. I may say here that with the exception of perhaps about 2,000 cases each new patient was examined by me personally. Among these 19,800 patients there were 1,995, or about 10 per cent., patients with marked laceration of the cervix. The total number of cases of cancer of the cervix was 18. From these 18 cases must be deducted 9 cases as not belonging to the class of women to whom my comments apply—they were either not of the Jewish religion or were not natives of Russia, Austria or Poland. At least 95 per cent. of our patients are of the Jewish faith and are natives of these countries. Therefore, roughly speaking, among 18,500 gynecological cases composed of Jewish women, natives of Russia, Austria or Poland, and among whom there were at least 1,500 cases of marked laceration of the cervix, there were only 9 cases of cancer of the cervix."

The question that one naturally asks is: "Why is it that these women presenting all the conditions, local and general, that admittedly favor the development of cancer of the cervix should practically be immune to the disease?" This seems the more strange when one bears in mind that cancer is very rife in the Jewish race. I have not at hand the data showing the relative predisposition of Jews to cancer, but Max Schüller, in the article referred to, speaks of their proneness to cancer as an established fact. At one time I was of the opinion that this practical immunity of the Russian Jewesses of the lower

classes might be due to the circumstance that almost invariably they nurse their children, and are thus insured the hyperinvolution of the uterus that attends lactation. But the poor of other faiths and other countries nurse their offspring, and, as we have heard from a good authority, cancer of the cervix is more frequent among them than among the well-to-do classes.

The opinion is gradually gaining ground with me that it may be due to their marital relations. These relations are definitely restricted by the Mosaic and Talmudic codes, to which these people give the most rigid adherence. Sexual congress is prohibited during menstruation, and during the seven days following the cessation of the flow, in fact the prohibition extends for even a longer period. The Mosaic code reads that the woman is to count seven unclean days (whether the flow lasts that long or not), and seven clean days, so that if the flow should last for more than seven days or return after it had apparently ceased she would have to begin to count anew from the termination of the last show of blood. In cases of menorrhagia, for instance, sexual intercourse might not be permissible for months. Again, after parturition, the Mosaic code enjoins abstinence from the sexual act for six weeks following the delivery of a female child, and eight weeks following the delivery of a male child. There are rules relative to the restriction of the act during gestation, but I am not familiar with their tenor, nor do I know that they are rigidly observed.

You will thus see that the rules prevent the irritation caused by the sexual act at unfavorable times, such as menstruation, during menorrhagia, from whatever cause, and during the period following delivery, when the uterus is in a condition of subinvolution.

I realize fully that these observations will require extensive confirmation by other clinical workers before any deduction is justifiable. My only excuse in offering these I may say unformed thoughts to you, at the present time, is the hope that they may stimulate other men with large clinical experiences in public practice to furnish us with the results of their observations. While the pathologists, in the dead-house and in the laboratory, are striving, by persistent efforts, to solve the knotty problem of the causation of cancer, it behooves us, as clinicians, to do what we can too in aid of the solution of the weighty problem, by a collection of carefully sifted clinical data, and by unbiased observations on the living victims of the disease.

THE NATURE OF CANCER.*

BY

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"Those who promulgate new doctrines are merely the organs of antecedent, predetermined, intellectual movements. The ever increasing tendency of modern scientific authors to ignore their intellectual predecessors cannot be too strongly reprobated."—*W. Roger Williams*.

I AGREE with Williams and warn you at the beginning that I have nothing original to present. My part in to-night's discussion is but to bring before you in as compact a form as may be certain recent thought on the nature and etiology of cancer as expressed by its special workers in this country and in England.

In endeavoring to do this I have chosen and often transcribed literally that which has seemed to point toward a path which may in the end lead us from the present darkness to the illumination of completed knowledge.

Tumors in certain members of the crucifera and other plants are known to be caused by a parasite known as plasmodiophora brassicæ. This plasmodium was discovered by Woronin in 1876 in tumors on the roots of turnips. He predicted that certain malignant growths in man would eventually be proven to be the result of a similar parasite. Various stages of these organisms have been described by Behla, Newaschin, DeBary, Podwysosky, Russell, San Felice, Gaylord, and others who have collected a certain amount of presumptive evidence.

Robertson and Wade (*Lancet*, 1905, Vol. I, p. 215) have recently traced out again the life history and forms of the plasmodiophora in the turnip and have found similar, or what they believe to be possibly identical, forms in carcinoma of the human breast and intestine and have succeeded in cultivating these forms in an artificial media.

They have traced what appear to be three parallel lines, namely. those of (1) the life cycle of the plasmodiophora brassicæ; (2) a series of bodies found within the cells of carcinomatous tumors. and (3) the stages of an organism that can be grown from such tumors. They state that all the stages of a plasmodiophora are

* Read before the New York Obstetrical Society.

accurately represented in carcinomatous tumors, and that it has been found impossible to construct a similar series from control tissues. At the same time many of the bodies which correspond in form and reaction to certain of the stages of a plasmodiophora are indistinguishable from certain tissue granules. The presence of any number of tissue granules does not, of course, logically exclude the presence of microorganisms which are known to have a certain resemblance to them. All that can be demanded from the histological evidence in support of a hypothesis like this is that the presence of bodies morphologically identical with the parasite as it is known in cultures or elsewhere should be demonstrated.

They admit that if the supposed parasites presented no very distinctive morphological features the evidence would certainly have very little weight. But in this case there can be demonstrated several such features of a very unusual and striking nature. The two forms of myxameba already known as they exist in the life cycle of the plasmodiophora brassicæ are definite forms that could not easily be simulated by the products of tissue disintegration. These forms have been observed in carcinomata and the presence of black granules in the originally clear center of the first variety has also been noted. The bodies which morphologically represent plasmodiophora in the nucleated preconjugation stage have been observed to be undergoing what is, to all appearance, mitosis. They claim that the minute wandering cells they have described cannot be identified in any cellular form known in the human subject, but would exactly represent the gamete of a small plasmodiophora. Lastly, a body has been found in a carcinoma which exactly conforms to the peculiar morphological characters of that phase of the plasmodiophora brassicæ which can be shown to follow conjugation.

They state further: The evidence derived from the study of the cultures is not subject to the same ambiguity of interpretation. In the sections of the growths in agar tissue cells are absent and an organism is present which has obviously been multiplying rapidly. In one instance, at least, this organism has been found to be present in four distinct forms, which harmonize exactly with four successive stages in the developmental cycle in the plasmodiophora brassicæ, as well as with that which has been found in sections of carcinomatous tissue. Included in the four stages observed in the cultures are the specially characteristic forms of the myxameba and the nucleated preconjugation stage. This evidence seems to us to be incompatible with any other conclusion than that

in these cultures we are dealing with organisms which are plasmodiophora. Taken in conjunction with the histological evidence of the presence of similar bodies in carcinomatous tissues, it points to the conclusion that plasmodiophora are constantly associated with carcinomatous growths of the kind from which the cultures were made.

The authors do not claim that plasmodiophora brassicæ is the cause of cancer, but only that a parasite of the same class is present in carcinomatous tumors.

H. R. Gaylord (Fourth Annual Report,, Cancer Laboratory, New York State Board of Health, 1902-'3) two years before had stated that there are inclusions in cancer which, viewed in the light of plasmodiophora, are best explained as parasites; that a comparison of the conditions found in clubroot with those found in malignant new growths in man show that we are now acquainted with a parasite capable in many ways of fulfilling the conditions required of a parasite for cancer.

While the theories of a cell included parasite as a cause of cancer have had many supporters, they have also roused sharp criticism and much study has been devoted to seeking out other explanations of the supposed parasites.

The causes to which cell inclusions in cancer have been attributed are (Hausemann) (1) degeneration of cells and anomalous secretion; (2) phagocytosis; (3) invagination; (4) abortive and pathological mitosis; (5) special organs of the cell, archoplasm or paranucleus; (6) extracellular hyaline drops; (7) cancer cells. These various explanations have been supported by different writers. In 1899 Plimmer claimed to find typical cell inclusions of constant morphology in all varieties of cancer and believed that these showed the parasitic origin of malignant neoplasms. R. B. Greenough has presented a study of these cell inclusions in each of the first three annual reports of the Cancer Investigation Committee of the Harvard Medical School. The last of these papers covers practically the entire work of the writer and shows that the typical cell inclusions of cancer are constant in cancer of glandular origin, are not found in epithelioma, and are almost invariably absent in sarcoma. He holds that their size, structure, and staining reactions are such as to justify the assumption that they are vacuoles in the cell protoplasm containing a material which is coagulated and shrunken by the use of tissue fixatives. The occurrence of vacuoles of this nature is chiefly a phenomenon of cell secretion. Similar vacuoles may be produced in certain cases by

phagocytosis and by degenerations of the nucleus. Secretion vacuoles of the form of typical cancer cell inclusions are found in certain non-cancerous diseases of the mammary gland. Cell secretion is a function which is lost in the progressive anaplasia of cancer cells, and cell inclusions are more frequent in slow-growing cancer and less numerous in advanced cancer with rapid cell division. Greenough thus finds no reason for the interpretation of these cell inclusions as of parasitic origin.

So, too, J. Collins Warren (First and Second Annual Reports to the Cancer Committee of the Harvard Medical School, 1900-1902) states that the theory that cancer is due to a parasite is not proven. His experiments included the inoculation of animals with tissue from fresh cancer, an attempt to isolate parasitic organisms from malignant tumors, and inoculation of animals with the blastomycetes of Sanfelice and Plimner. As a result of these investigations and those of other members of the commission, he holds that the lesion produced by the coccidium oviforme is essentially a process of chronic inflammation and is not analogous to the lesion seen in cancer. The lesion in molluscum contagiosum is characterized by certain changes in the epidermis, is not due to the action of a protozoon, and is not analogous to cancer. The so-called blastomycetes of Sanfelice and Plimner are torulæ and the lesions produced by them are essentially nodules of peculiar granulation tissue, are not cancerous nor in any sense true "tumors." Blastomycetes are not constantly present in human cancers. The peculiar bodies seen in cancer cells are not parasites nor the cause of the lesions, but probably in part at least atypical stages of the process of secretion by glandular epithelium.

Calkins, in a paper on cell inclusions in carcinoma (Annual Reports of the Work of the Cancer Laboratory of the New York State Department of Health, 1904) summarizes his conclusions as follows: There are two main groups of inclusions in carcinoma, those which are encapsulated and those without capsules.

Encapsulated inclusions appear under several forms, sometimes definitely cellular, in which case they are recognizable as blood cells or epithelial cells, sometimes variously modified by degenerative changes and unrecognizable.

The various modifications of such inclusions have been variously and erroneously attributed as stages in the life history of protozoan parasites.

Attention is called to the fact that parasites in cell protoplasm

cannot get food nor rid themselves of waste products when enclosed in capsules.

The same principle may account for the degeneration of encapsulated invading cells such as leucocytes, lymphocytes, etc.

Capsules or cysts around parasites are formed, not by the cells, but by the parasites at periods of reproduction or for protection of spores, etc. Capsules around cell inclusions in carcinoma are formed by the protoplasm of the invaded cells.

Non-encapsulated inclusions in the form of secretions, degenerations, metaplastic modifications, etc., are likewise present in cancer cells. These must be correctly interpreted before any parasite hypothesis is advanced.

The X-body of Behla is not satisfactorily explained as metaplastic, degeneration, or secretion product, although it is not yet known to be independent from blood-cell origin. It appears without a capsule, but lies in a vacuole in the cytoplasm or nucleus. It possesses granules which take up chromatin dyes with intensity. In some cases it shows strong evidence of spontaneous movement.

Theoretical considerations are not entirely sufficient to outweigh the morphological evidences of an organism. The small number of inclusions indicates that no such results are to be expected as those which follow the presence of masses of parasites as in small-pox or scarlet fever, but experimental results show that great proliferating stimuli may be given by minute quantities of poison and, *a priori*, grounds are thus obtained to justify the effect, in this case a tumor, through the activity of a relatively few parasites.

The proliferating epithelial cells of carcinoma do not show the characteristic of embryonal cells, but rather of senile degenerative cells, as shown by cell and nuclear hypertrophy, and by loss of the self-regulating power, which is particularly characteristic of young or embryonal cells.

"Plimmer's bodies," a familiar type of the so-called parasites, are vesicles having a fairly well defined wall containing a clear space, in which is suspended a small, darkly staining granule. They lie in the cytoplasm of the cancer cell and usually in close proximity to the nucleus. In size they vary from excessive minuteness to that of the nucleus itself. They have been supposed to be peculiar to cancer cells and have been interpreted as parasitic organisms or as a differentiation of the cytoplasm of the cancer cell itself. Farmer, Moore, and Walker (*Lancet*, 1905, Vol. I, p. 1411) find that similar bodies are a constant feature in the spermatogenetic cells of vertebrates and other metazoa.

This remarkable parallelism seems quite significant in that both classes of cells are autonomous to a high degree, both multiply independently of the tissue requirements of the organism, and both exhibit cellular and nuclear metamorphoses which are similar and which differ from those pertaining to normal somatic cells.

Beard (*Lancet*, 1905, Vol. 1, p. 281) believes cancer to be of embryonic origin. He defines it as an "irresponsible trophoblast." Any ordinary cancer or sarcoma is a new development of trophoblast, due to the attempt of a germ cell to start the life cycle anew. Except in mode of nutrition this irresponsible trophoblast does not resemble normal trophoblast, but it often mimics the structure in which it lies or it is like no other organ or tissue in the body.

Beard classifies neoplasms under three heads, a consideration of which will serve to make clearer his definition of a malignant tumor.

1. *Embryomata*.—Benign neoplasms, pathological manifestations of some greater or less portion of an embryo. They are composed of normal or somatic (embryonic) cells or tissues. At its basis each is a greater or less portion of a twin, triplet, and so on, identical with the individual containing it. They are not endowed with indefinite powers of growth and they nourish themselves like other normal tissues.

2. *Amphimyzomata*.—Malignant neoplasms. Combinations of embryomata and trophoblastomata. Pathological manifestations or attempts to reproduce the whole life cycle, including trophoblast and embryo. They are transitional forms.

3. *Trophoblastomata*.—Malignant neoplasms. Pathological manifestations of the asexual portion (trophoblast) of the life cycle and sometimes, whether or not always is not at present known, attempting to repeat the germ cell portion of the life cycle, as shown by the researches of Farmer, Moore and Walker. They are not known to differentiate actual functional gametes, eggs and sperms. They never include or repeat any part of the embryo. They are never composed of somatic (embryonic) cells, though they may mimic such, or even resemble no other cells in the body. As Sir James Paget pointed out long ago, they are "imitation tissues." They exhibit powers of unlimited growth and increase and they nourish themselves by eroding and destroying normal cells and tissues in a manner exactly like that of the trophoblast of normal development.

Roberts (*Lancet*, 1905, Vol. 1, p. 1031) defines a cancer cell as

one with a nucleus overcharged with energy, and in a similar state to the cell which results from the union of the male element with the ovum and showing its characteristic tendency to divide.

Beatson's (*Brit. Med. Jour.*, 1905, 1, 921) "germinal theory" is that cancer consists in the epithelium of the part affected taking on the active proliferation which is the marked characteristic of the germinal epithelium, and that the special cells seen in sections of cancer and known as cancer bodies will eventually be shown to be special ova or germinal cells. He assumes the existence of a general tissue secretion which is necessary to the perfecting of the germinal elements (ova, spermatozoid and that when through functional inactivity of ovaries or testicles this fluid is not employed it tends to accumulate mostly in the fat tissue of the body and is ready to act at any point where irritation may predispose to cell proliferation. He finds confirmatory proof in the fact established by Farmer, Moore and Walker, that there exist in malignant growths special cells characterized by a reduced number of chromasomes and that have their prototype in the reproductive cells of the body. He believes a carcinoma to be made up of two separate portions, one part composed of cells that have been thrown off as a secretion and another part that is glandular in that it is doing work on a secreting tissue; in short, that there is being enacted in the tissues the same cell activity and proliferation that goes on daily in the ovaries and testes. In this view, which is somewhat allied to the old "spermatic theory," the masses of the tumor cells are not a tissue at all, but are cells thrown off by altered somatic cells in the elaboration of a special secretion.

Edward H. Nichols (Third Report of the Caroline Brewer Croft Cancer Commission of the Harvard Medical School, 1905) presents the results of a series of implantations of tissue in 62 animals. The tissues employed were both adult and fetal, chiefly epithelial, although some mesenchymal tissues were used. The experiments were undertaken to see if epithelial or mesenchymal tissues, set free from their normal environment, could acquire a power of unlimited growth and give rise to the formation of metastases. They were undertaken because the evidence so far produced seems to point to the causation of cancer by some inherent character of the epithelial cells rather than to a parasitic origin. The implantations were made into other parts of the same animal, or in the case of fetal tissues into the maternal body. In some cases the implanted tissues proliferated, maintained their vitality,

and produced nodules analogous to dermoid cysts or teratomata, and in some these nodules were of large size. In no case was any nodule produced with unlimited growth or the formation of local or glandular metastases. In no case was epithelium of a highly differentiated function seen to maintain its power of growth or to proliferate. The "potentiality of growth" is greater in fetal than in adult tissues. The transplanted tissue did not infiltrate surrounding tissue. In the case of transplanted fetal tissues there was not a reproduction of the stage of development at which they were transplanted, but a tendency to produce the ultimate stage of their normal development. All this evidence points strongly against the idea that cancer is caused by simple misplacement of cells.

This author, in reviewing the literature of the etiology of cancer, and speaking of its possible parasitic origin, says that the relative increase of cancer is disputed and not proved; that local causes of cancer are improbable; that the metastases in cancer, though taking place by the same routes as those in infectious diseases, are of an absolutely different origin and constitute the strongest theoretical argument against an infectious or parasitic origin. The cachexia in cancer is probably not due entirely to the character of the cancer itself but is often dependent upon secondary bacterial infection. There is no proof of the transfer of cancer from one human being to another by contact, though transplantation of cancer from one animal to another of the same species is well verified. The production by any known parasite of epithelial proliferation analogous to cancer has not been demonstrated and no supposed cancer protozoon has been isolated, cultivated, and inoculated in accordance with Koch's law.

The most important and interesting facts that have come under my observation are those developed at the laboratory of the Imperial Cancer Research Fund in London, of which Dr. E. F. Bashford is the Director and General Superintendent of Research (Scientific Reports, Nos. 1 and 2, and *Lancet*, 1905, Vols. I and II.) The investigations under Dr. Bashford's direction are conducted in a most broad and scientific spirit, and include statistical facts collected under government supervision from all of England's possessions as well as experimental and other scientific work done at the laboratories.

They have established the fact that cancer presents the same essential characteristics throughout the whole vertebrate phylum.

It is found in all domestic animals, in wild mammals, and in fish. It occurs in all races of men, both those whose diet is chiefly or entirely vegetable and those who subsist on flesh.

The comparative study of sporadic malignant new growths has proved that they occur in animals with increasing frequency as age advances, both in species with a long and with a short duration of life. They appear in considerable numbers in mankind after from 45 to 50 years; in the horse, dog, and cat, after 9 years; in the trout after from 5 to 7 years; and in the mouse after 2 years.

The higher incidence manifests itself after an interval which varies in different species in direct relation to the absolute duration of life. The maximum incidence coincides with the decline in reproductive activity. Cancer occurs in castrated animals at the same period as in entire animals, so that it cannot be said that the cessation of a normal secretion nor the appearance of an abnormal one is the cause of the maximum incidence at this time (sex pause).

The age incidence of cancer in different organs of individuals of the same species presents contrasts similar to those found in different species with long and short lives. Thus, for example, cancer of the trophoblast (*deciduoma malignum*) begins with the degeneration of the chorion often about 50 days after impregnation, cancer of the breast at the time of the cessation of its activity in the fourth decade and cancer of the skin in old age.

The statistics of the Cancer Research Fund also show that sarcoma is equally widespread over the vertebrate tribe and that it increases in frequency as life advances just as does carcinoma. This at once raises the question of their similarity.

This wide distribution and identity of character of carcinoma throughout the whole vertebrate family prove that cancer is primarily based on the few conditions which are common to the forms in which it occurs and that it is only incidentally a problem of human pathology. The cytological and experimental investigations of carcinomata as a whole bear out this conclusion and show that the essential factors must be sought in the potentialities residing in the cells which constitute the living body. The great diversity of the conditions of life of the forms in which malignant new growths are found makes it exceedingly doubtful if external agencies play any part in determining the incidence of the disease.

Transmission of cancer from man to animals or from one

animal to another of a different species has never been successfully accomplished, and in view of our present knowledge of cytolsines and cytotoxines we can easily see why such attempts must always result in failure. The consequences to the transferred cells are analogous to what occurs when blood corpuscles from one animal are injected into another of a different species. They are destroyed as an albumen strange to the species.

In striking contrast to the uniform failure of such experiments is the occasional successful transmission of malignant new growths from one animal to another of the same species. The most recent and careful observations of this kind have been made by Jensen of Copenhagen, who transplanted a mouse epithelioma, and Borrel of Paris, who records a similar transplantation of a mouse adenocarcinoma. Jensen placed at the disposal of the Cancer Research Fund a portion of one of his mouse tumors of the twenty-third generation, and from this tumor some 3,000 observations have been made which in general completely confirm Jensen's results. The new tumors are the genealogical (or histological) descendants of the cells introduced. Transplantation is artificial metastasis and only differs from natural metastasis in that the latter occurs spontaneously in the individual primarily attacked, whereas the former is experimentally effected from one individual to another. The process is in no sense an infection, the tissues of the new host not participating in the formation of the new parenchyma.

The experimental transmission of cancer means the continued growth of the tumor cells of one animal in a succession of other animals. The tissues of the new hosts do not acquire any cancerous properties; they merely react to the presence of the cancer cells and supply them with nourishment. The process is fundamentally different and distinguishable from all known processes of infection. The transference of cancer cells from one mouse to another, therefore, affords them an opportunity for continuing to grow in a succession of animals. Jensen's tumor is growing to-day with undiminished energy five years after the death of the mouse in which it arose, and therefore for a period of two years longer than a mouse lives. In Bashford's experiments growth has proceeded in some 3,000 mice successively, all of which are now dead, yet the tumor cells themselves are multiplying in other mice as actively as ever and producing enormous masses of tissue. The power of proliferation stands in no relation

to the normal length of life, nor to the limits set to the growth of a mouse. (*Lancet*, 1905, Vol II, p. 1673.)

Age seems to have no influence on the proportion of successful transplantations in contrast to its cardinal importance in determining the initiation of the cancer cycle. Multiple tumors can be obtained and successive implantations made on the same animal. When the tumor tissue is broken in a mortar until intact cells are no longer found inoculation is invariably negative.

All of these facts point to the cell as being the essential feature in the inception of cancer and lead us to seek for the peculiarities in the cell life of normal and cancer tissues which limit the power of independent existence in the former and raise the power to the level of being the chief characteristic of the cells of the latter.

By what peculiar process does an isolated group of cancer cells give rise to a new growth with powers of proliferation like those of the tumor from which it was derived? It seems justifiable to assume that if this question were answered, much that is obscure in the action of malignant tumors would be cleared up. To throw light on this problem the nuclear changes in young transplanted mouse epitheliomata were subjected to careful analysis, and in certain cases processes of conjugation (or fusion of nuclei) were observed identical with the process of conjugation in many protozoa and lower plants and probably of the same significance—that is, the starting of a new cycle.

One of the tumors of the twenty-fifth generation which had recently grown rapidly and which showed conjugation figures was used to effect transplantations into 69 normal mice, and on the same day another tumor of the twenty-fourth generation which had grown very slowly and in which no conjugation figures could be found was transplanted into 47 normal mice. Twenty-two days later in the 69 mice which had received portions of the tumor showing conjugation and rapid growth there were 34 rapidly growing tumors. In the other series which had been grafted with the slow-growing tumor in which no conjugation was observed only three minute tumors were detected in the 47 mice.

Conjugation or fertilization is in all forms of life the starting point of a new generation. It is always followed in normal conditions by new and independent growth and is then capable of explaining the independent growth of cancer and its metastases.

In the researches mentioned pieces of cancer tissue from mice

are grafted into other mice and grow through several generations. The results noted are not the result of infection, but of the continued growth of the same tissue.

In explaining the phenomena of growth all attempts to unravel the confusion of cell division in sporadic tumors have failed to pick out the essential from the negligible phenomena. In artificially propagated tumors the difficulties fortunately give promise of being more easily surmounted. The long-continued observations on many generations of transplanted tumors have yielded the valuable results that a tumor maintains unaltered its general histological characters under the longest propagation yet attained, and also the minute cell characters, including the nature of the differentiation and that constant number of chromosomes which is normal to the tissues of a healthy animal. Cell proliferation proceeds throughout all generations by typical bipolar mytosis. The various forms of irregular cell division which are such striking features of sporadic tumors do not occur, and the process of proliferation becomes orderly. Yet at recurring intervals the heterotypical mytosis is found distributing half the normal number of chromosomes to the daughter nuclei. Since in all other dividing cells the normal number of chromosomes is retained, it follows that, if the heterotypical mytosis is anything more specific for cancer than the other irregularities present in sporadic tumors, it must be an essential phase intercalated in the process of growth. Fusion of the daughter nuclei would be necessary to restore the normal number of chromosomes and might be expected to establish powers of proliferation and of relative independence such as follow the nuclear fusion of fertilization, and to result in behavior similar to that of an organism of a succeeding generation toward the one which has preceded it. If the first interpretation is correct, Bashford believes the apparently uninterrupted growth may be further analyzable. We may expect it to be a discontinuous process maintained by an orderly series of cell changes, and the explanation of the stages through which the cells of fully developed tumors pass in the incessant renewal of proliferation will indicate the nature of the changes which set the growth going.

In a provisional interpretation of the observations thus far made, he summarizes the main results as follows:

1. Cancer is identical in all vertebrates, and in growing accommodates itself in a striking manner to the time limitations imposed by the compass of life in different animals.

2. Under favorable experimental conditions the growth of cancer is indefinite, of enormous, and, so far as we can judge, limitless amount.

3. Artificially propagated cancer displays all the characteristic features of the growth of sporadic tumors.

4. The growth of artificially propagated cancer is due to the continued proliferation of the parenchyma cells.

5. The artificially propagated parenchyma makes the reaction of the host subserve its own needs.

6. Artificially propagated tumors cause no symptoms in the organism to which they have been added.

7. The power of differentiation is definite in one direction only, even three and a half years after separation from the original host.

8. The number of chromosomes constant for the healthy body tissues is retained, notwithstanding the recurrent reduction of this number to the exact half.

9. The balance of evidence is in favor of the growth being interrupted and not uniform and continuous.

10. From the standpoint of therapeutics the investigations of the Imperial Cancer Research Fund thus far establish the early surgical treatment of cancer and of the conditions suspicious of cancer, upon that experimental and rational basis which has hitherto failed.

Artificially propagated tumors produce metastases, as do sporadic tumors. Sufficiently early removal of the local transplanted tumor removes metastasis from the region of possibility and the immediate practical outcome of the whole investigation is a strong experimental justification of early operation in cancer.

In a later paper Bashford (*Lancet*, 1905, Vol. II., p. 1673) disappoints our hopes of a speedy solution of the problem by stating that further study has led him to discard, as being incompatible with the facts, the hypothesis that growth might be maintained by the intercalation of heterotypical mytoses (like those of reproductive tissue), followed by nuclear fusion. In his investigations he believes he has obtained evidence against all the explanations yet advanced as to the cause and nature of cancer, proof that cancer cells have not reverted to an embryonic undifferentiated state, or that the growth and ceaseless cell division of cancer resemble the intermittent growth and cell division of reproductive tissue, or that the artificial propagation of cancer resembles the grafting

practised by horticulturists in the propagation of plants and trees. Attempts to directly ascertain the cause and nature of cancer are surrounded by so many sources of fallacy that to his mind they remain to-day as unprofitable as they have been in the past.

He says further: The artificial propagation of cancer tells us nothing directly as to the origin of cancer; it only indicates that the distinctive characters of any single malignant new growth, once acquired, are probably permanent, for under artificial propagation different carcinomata of one organ (the mamma) retain their individual characteristics. They are not convertible into one another, nor do they merge into a common type. Artificial propagation gives the opportunity of studying many of the properties of malignant new growths in detail with a thoroughness unattainable in the case of sporadic tumors. It has already proved the inadequacy of the standards by which an anthropocentric pathology has attempted to measure the proliferation and to probe the nature of cancer. The true measure of that proliferation has not yet been arrived at. Its study suggests what appears at first sight to be a series of new problems, but may really be restatements of old ones—viz., Why is the amount of the growth of cancer relatively greater than that of any vertebrate organism? Are growth and cell division always progressive? Is cancer subject to a process of natural decay, or, if not, how is its energy of growth and assimilation maintained? To all these questions it should be possible to obtain definite answers, and then the original problem, so long the object of futile direct attack, will present itself in a form more approachable than the old problem, "What is the cause of cancer?"

TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

Meeting of January 9, 1906.

The President, LeROY BROUN, M.D., in the Chair.

The evening was devoted to a discussion on

THE CAUSE AND ETIOLOGY OF CANCER OF THE PELVIC ORGANS.

DRS. BROOKS H. WELLS and H. N. VINEBERG presented papers.

DR. JOSEPH E. JANVRIN.—I have listened with pleasure to the papers, and they have given me considerable information. My own work has been particularly in the line of cancer of the uterus and the pelvic organs, and what I want to say to-night refers strictly to the practical ideas and the knowledge which has come to me in that work. I believe that one of the principal things for us to do as surgeons, is to recognize the condition as early as possible, and to instruct our friends and the general practitioner as to the absolute necessity of a thorough examination of all cases in which there is anything indicating any diseased condition of the uterus, endometrium or cervix which is manifested by irregularity in the flow, or occasional spotting of blood. Of course, we all know that the majority of the cases come to us late, when the disease has become established, and when there is no question whatever as to the propriety of operating. I am speaking of cancer of the uterus, the cervix or body, or both. Although the majority of the cases do come to us in a fairly advanced stage, once in a while we find a case of beginning cancer of the cervix which can be readily diagnosed as such, not absolutely by a physical examination, but by the microscopic examination of sections of the tissue removed from the cervix. I have had the fortune to meet with many of that kind during the past twenty-five years, but more particularly during the past fifteen years. On the other hand, probably nine out of ten of the cases that come to us are so advanced that there is no question as to the malignancy. In all such cases there is only one method of treatment. I have never seen good results from the x-ray applied to the cervix, or externally to the pelvis. Therefore, we must treat these cases surgically, and the sooner the radical operation is done, the better. My own choice is generally the vaginal operation, unless there are some conditions present which

make vaginal section more difficult than the abdominal. It is a well known fact that cancer of the cervix has a tendency to proliferate rapidly into the parametrium. These cervical cases are of more serious import, and much more grave in their results than cancer of the endometrium, or cancer which begins in the endometrium and extends into the body of the uterus. At the same time, in that class of cases my method has usually been to operate by way of the vagina, and in removing that organ I ordinarily remove the ovaries with it, and, at the same time, go as far as possible into the parametrium and cut out and dig out all the tissue I can. After that I sear the tissues with the cautery. Three years ago I read a paper with statistics, giving the ultimate results in 50 cases. In 38 cases the operation was performed per vaginam, and in 12 abdominally. Those statistics dated from 1880 up to January, 1899. The paper did not appear until four years subsequent to the operations. The gross results showed 24 per cent. of absolute and permanent recoveries. In this number of cases there were perhaps 10, possibly 15, which had been diagnosed quite early. What the cause of cancer is I believe none of us know. In cancer of the cervix uteri, however, much credence should be given to the idea that it comes from irritation. As Dr. Vineberg has said, it is not from an acute traumatism, but from protracted traumatism or irritation. The majority of the cases of cancer of the uterus occur in women who are married and who have borne children. I know that three-quarters of such cases occur in the married woman, and generally those who have borne children. On the other hand, it is not infrequently met with, especially cancer of the cervix, in the unmarried female; but in the majority of such cases it occurs late in life. In such cases, of course, it is not due to local irritation. Whereas, in the case of the married female, with lacerations, etc., I think a good percentage is due to traumatic influences. The extension of cancer of the cervix to the vaginal tissues occurred among the cases I reported four times. In every case the involvement was slight. It seemed confined absolutely to the mucous surface; if below that it was but slight. In such cases my method has been to operate per vaginam, although in one case I did the abdominal operation. The object was not only to take out the uterus and as much of the parametrium as possible, but also to remove from one-half to three-quarters of an inch of vaginal tissue, below the part where there could possibly be diseased structures.

DR. EDWIN B. CRAGIN.—I was exceedingly interested in the suggestions made by Dr. Vineberg as to the possibility of the comparative immunity of the Jewish race to cancer of the uterus being due to the observance of the Mosaic law. It seems to me that this point is of extreme interest for the reason that it has been held by most of us that the continuation of irritation predisposed to cancer of the uterus, the same as continued irritation seemed to predispose to cancer at any junction of

cutaneous and mucous surfaces. Take, for instance, epithelioma of the lip in a person who uses a pipe, the epithelioma occurring in the spot on which the pipe usually rests and irritates, which is perhaps the seat of a crack. Take again a chimney-sweep's cancer, so-called. In so many instances it does seem to be due to traumatic irritation long continued. The fact that the Jews seem to have a relative immunity on the one hand, and are relieved from one source of irritation for one-half a month on the other, certainly deserves our consideration as to causal relation.

As to the etiology of cancer, I was disappointed in not hearing more brought out regarding the relation between fibromyomata and carcinoma. Perhaps my experience is different from that of many men, but although I have had a good many fibromyomata examined, I have never yet received a report from the pathologist that the tumor that I knew started as a fibromyoma was malignant. With the present hue and cry of the danger of fibroids so-called becoming malignant, it seems to me perhaps worth while to mention this as the experience of one man, at least.

Associated? Yes! But as for a change from fibromyoma into cancer, I have not met with it. If the treatment of malignant disease is to be brought into the discussion, I can heartily endorse all that Dr. Janvrin has said.

It seems to me that the supposed greater longevity resulting from the extensive radical abdominal operation, dissecting out the enlarged glands in the pelvis, has been more than offset by the increased primary mortality.

Where the glands are extensively involved, extending, perhaps, up to the kidney, in my judgment, the case had better be left alone. In cases suitable for operation I agree with Dr. Janvrin in preferring the vaginal operation, unless the uterus is too large, but in this operation, making the excision as complete as possible. When it comes to the question of whether vaginal hysterectomy for cancer of the cervix pays, it is interesting to recall the following: Last month I wrote to the son of a patient of mine, now living in Chicago, upon whom I had performed vaginal hysterectomy for cancer of the cervix, eight years ago, asking if his mother was living. He replied that not only was she living, but, save for an occasional headache, she had been perfectly well since the operation. There are many disappointments, but a few cases like the above prove that a vaginal hysterectomy, with as complete an extirpation of the disease as possible from below, pays.

We should endeavor to recognize the disease as early as possible, and remove as extensively as possible with the least damage to the woman.

DR. MALCOLM McLEAN.—With reference to cancer and laceration of the cervix, in my experience, cancer of the cervix has been so frequently associated with, and taking its origin

in, an old laceration, that I look upon that condition as too dangerous a one to be neglected. There is a direct relation between the two, I believe. I endorse thoroughly what Dr. Cragin said regarding fibromyomata and cancer. I believe fibromyomata and cancer may be associated, but I believe that fibromyomata seldom, if ever, degenerate into cancer. I have seen cancerous disease supervene in some patients who have had myomata in another part of the uterus.

DR. EGBERT H. GRANDIN.—If the committee on the selection of topics for discussion had endeavored to select a hard nut to crack, it could not have gone further than to have given us to-night the subject of the etiology of cancer of the pelvic organs. I confess that as I look back nearly one-quarter of a century, largely devoted to the study of the diseases of women, I know as little of the etiology of cancer of the pelvic organs to-day as I did twenty-five years ago. I do not and cannot accept the parasitic doctrine; nor can I accept the infectious doctrine; nor can I, without limitations, accept the disease as one due entirely to irritation; and for the following reasons, as belonging to all three of the above active factors: I have yet to see a case of cancer of the pelvic organs in the nullipara; I have yet to see a case of cancer of the pelvic organs in a virgin, and I have yet to see a case of cancer of the pelvic organs in a prostitute. I have known many women with cancer of the pelvic organs who have had, for months, repeated intercourse with husbands, and yet I have to see a case of extension of the disease from the woman to the husband. So far as the traumatic view is concerned, I used to think that laceration of the cervix predisposed to cancer, and yet as I consider the class of people that I see with great frequency, the Italians, in whom laceration of the cervix exists so uniformly, because the vast proportion of them are confined not by trained men, but by midwives, I can only recall in about 1,500 Italians two cases of cancer of the cervix. This would be my answer to Dr. Vineberg's statement regarding the immunity of the Jewish race from cancer as due to the fact of their observance of the Mosaic law. If there is a class of people who copulate at all times, it is the Italians, and I can only recall two cases out of 1,500 who have had cancer of the cervix; and probably of this number 18 per cent. at least have had lacerated cervixes, and certainly the Mosaic law does not hold good with the Italians. Again if there be not something more than traumatism in these cases, why is epithelioma of the cervix practically an incurable disease? As I look back over my operative record I cannot recall one case of hysterectomy for cancer of the cervix which has survived three years. Yet, I can recall many a case of primary cancer of the fundus which to-day is alive, nine or ten years since operation. We are dealing, therefore, with something more than traumatism; we are dealing with something more than mere irritation; with something more than parasites or in-

fections. What it is I do not know. I do not believe anyone here knows, not even any member of the committee on selection of topics.

With regard to the treatment of cancer, I wish to go on record as stating that I do not believe that to-day vaginal hysterectomy has any reason for existence in the treatment of cancer of the uterus. If you are going to operate at all, it should be from above, where you can take out much more than you ever can from below, if you know your business. You can do it as quickly and with less shock and with less possible ulterior damage to the woman than if you went in from below, by clamp, ligature or the galvano-cautery.

To sum up the matter, we must still seek the etiology in the cell, whether it be due to lowered vitality or to lowered resisting power. This may not mean much, but surely as much as the doctrine of parasitism implies.

DR. RALPH WALDO.—We know, as a clinical fact, that we may have the ovary, the body of the uterus, or the cervix as the seat of primary cancer. We know that when cancer starts in the ovary, it extends late to the other tissues. Why? We do not know. We know that when cancer starts in the fundus of the uterus it extends late to the other tissues, and the patient may live four or five years, even longer, after the symptoms of cancer first appeared. We know too that in these cases cancer usually extends late to the cervix. Clinically, when cancer starts in the cervix, it extends very late to the body of the uterus. But we do know that in quite a percentage of the cases it extends quickly to the parametrium, and in another percentage of the cases, a fairly large one, it extends fairly quickly to one or both of the ovaries. Whatever theory may be accepted as the cause, we are all pretty nearly agreed that cancer starts as a local disease. We know that in nearly every instance, it starts in the cervix of a woman who has given birth to children. Perhaps two-thirds of the cases of primary cancer of the fundus uteri occur in those women who have borne children. Now these are a few clinical facts that have been threshed out, and it leads us to the consideration of the treatment. I rarely perform abdominal hysterectomy for cancer of the uterus, of either the cervix or fundus. I show a specimen to-night, with microscopical slides, removed from a patient who went five years after a vaginal hysterectomy for cancer of the cervix, without having the disease return. So that I cannot agree quite with Dr. Grandin, when he says that none of the cases cannot be cured by this operation. I had another experience with cancer of the cervix, occurring in an old woman. It was one of those bad sloughing affairs; the whole cervix had sloughed out and a radical operation was deemed to be absolutely improper. At the operation the parts were most thoroughly cauterized, expecting to give only temporary relief to the patient. She left the hospital,

and the house-surgeon, who left the hospital three or four years ago, told me that the patient was in his care and the disease seemed to be arrested. She has lived four years after the time of the extensive cauterization. This is the only instance where I have had anything but temporary relief follow this procedure. This is a local disease, to begin with, and when it extends so as to involve the lymphatics of the pelvis, there is no use resorting to any extensive operation. The late Dr. Pryor operated extensively upon two cases, removing by abdominal section the whole uterus, tubes and ovaries, the lower portion of the rectum and perineum. I ran across one of those cases, and there was a returned cancer. Dr. Pryor said he was glad to hear of the after results. The other case, he told me, had a return of the disease and died.

DR. L. GRANT BALDWIN.—Regarding the immunity of the Italians, I wish to say that after an extensive hospital service among Italians, Irish and Jews, about 25, 2-5 and 1-5 respectively, I can recall but one case of cancer among the Jews, and that was of the breast. And yet there were many cases of cancer of the cervix among the Italians. Roughly speaking, out of about 1,000 cases, there were 20 cases of cancer, and these occurred in the Italian women.

DR. JOSEPH E. JANVRIN.—With regard to degeneration of fibromyomata into cancer, referred to by Drs. Cragin and McLean, I have never seen a case. I have, though, seen half a dozen cases of associated cancer of the uterus and fibromyomata of the body of the uterus. I believe I had the pleasure of presenting the first case of that kind before this society, twenty years ago. In that case there was a cancer of the cervix, with a fibroma in the anterior wall as large as a pullet's egg.

With regard to the prevalence of the disease amongst the rich and the poor, my experience has been that the cases appear nearly equally. I see the disease in those who are well nourished, who live in luxury, and who have the facilities for taking good care of themselves; and I also see these cases quite as frequently in those who are not well nourished, who do not live in luxury, and who do not have the facilities for taking good care of themselves.

Regarding traumatism as a cause of cancer, what I intended to convey in my remarks was this: That irritation long continued, such as frequently occurs in married women with lacerated cervices, often results in the cancerous condition, especially in patients in whom there is a predisposition or tendency to the development of cancer.

DR. C. A. VON RAMDOHR.—I have had many Jewish patients in my practice at the German Polyclinic, and I have seen exactly the same ratio of cancer among the Jewish race as Dr. Vineberg. They have many lacerations, but few cancerous tumors. On the other hand, in reply to Dr. McGinnis, it is

rare among the negro race to see carcinoma, yet they so frequently develop fibroma.

DR. H. N. VINEBERG.—In answer to Dr. Cragin, regarding fibroid growth, I am practically of the same opinion as he is, and in reading the papers in the German literature on this subject it will be found that all agree that a fibroid never irritates the uterus to such an extent as to bring about cancerous disease. Dr. Grandin's own statistics favors the thought I expressed here. Among 1,500 cases he said he had seen 150 with laceration of the cervix, or 10 per cent. had, and out of this number, 150, he had found two cases of cancer. According to that percentage I should have seen 25 cases in 1,800 cases of laceration of the cervix, but I only saw 9.

With regard to Dr. McGinnis' observations of the negro race, that does not apply at all, for it is well known that negroes are not subject to cancer and, therefore, they should be thrown out of a discussion of this kind.

The Jews, as a class, are subject to cancer, and the male Jews have it as frequently as other people of other faiths. That chronic irritation is a factor in the production of cancer, I do not think anyone would doubt that; even the pathologists accept that. Cancer of the pylorus occurs where there is the most irritation; you get cancer on old scars in the stomach. You get cancer from irritation of gallstones, etc. I have a case now in the hospital, showing that chronic irritation may cause the development of cancer. Five years ago she was operated upon for kraurosis vulvæ, and she has been under observation since. About two years ago she again developed some pruritus, and naturally scratched the parts very much, and three months ago she returned, and, to my sorrow, a cancer developed on the vulva near the posterior commissure. This I excised, and it proved to be a true cancer. I know that Dr. Brettauer has seen three cases of cancer follow kraurosis vulvæ.

I have merely brought to your notice certain facts, and I do not feel myself called upon to defend the thought that they gave rise to. As I stated in my paper my object is to stimulate others with large dispensary practice to collate their data, and thereby we may be able to gain some knowledge regarding the predisposing causes of cancer of the uterus. Just as in tuberculosis, most of the characteristics of the disease were known before the discovery of the bacillus. So in cancer, by patient clinical study we may learn a great deal about the disease, while the pathologists continue in their search for the sure pathogenic agent.

DR. BROOKS H. WELLS.—The consideration of the statistics of a large number of cases seems to show that cancer is more a disease of age than of nationality or any other condition. That cancer occurs in all members of the human family rules out many conditions that might be applicable to Italians

Germans, or others. In not only the human race, but in other animals, cancer occurs at about the end of the middle third of life, at the decline of reproductive activity. The consensus of the best knowledge that belongs to the subject would seem to point not to the parasite, not to any outside influences, but to some inherent quality in the senile cell.

When tissues begin to be senile they begin to be the subject of cancer. This applies to every tissue in the body, and probably to every member of the vertebrate family. Cancer cells acquire the property of unlimited growth and multiplication; whether this be due to conjugation of cells, or to some other cause, I do not know. Investigations along that line in the study of the cell itself will, in the end, throw light on the subject. If there is any parasite, it is the cancer itself; the cancer in the body is the parasite in that body. Cancer itself does not cause cachexia; this does not occur until there are other infections, or interference with function. The lesson derived from all recent investigation is that of early operation, with the best possible care to avoid the implantation of the cancer cells on raw surfaces. The brilliant results of Byrne were gotten by cutting through the tissues with the cautery, which left a seared surface into which the cancer cells could not be implanted. Transmission of cancer from husband to wife is very rare, because to accomplish transplantation means that a bit of the clean cancer cells must be inoculated aseptically. If we could conceive that the vaginal and penile tissues were aseptic, then possibly the cancer cell could be implanted. But practically the chances are infinitesimal that cancer can be so transplanted, and I would like to be told of a well-authenticated case. In some of the cases reported the supposed inoculations were not even of the same histological variety, yet all the researches prove that cancer, when transmitted, must reappear in the same form as in the original growth.

Dr. Grandin mentioned that he never saw a case of cancer in a nulliparous woman. One and a half years ago I saw a young woman of 23, who had only had sexual intercourse for a short time. She afterwards "spotted," and I felt sure she was going to have a miscarriage. Fortunately I had the scrapings from the curettage examined, and the pathologist reported an undoubted carcinoma, for which I performed a hysterectomy. I am watching that young woman with great interest. Some years ago I saw a cervical growth in a girl of 18 years, which the microscope proved to be carcinoma.

Dr. Grandin's remark on the rarity of cancer in virgins, in prostitutes, and in nulliparæ is explained by the fact that women in these classes are themselves in a very small minority by the time they reach the cancer age. Lacerated cervix, chronic eczematous conditions of the nipple, benign tumors and other conditions supposed to lead to chronic irritation, when studied in very large numbers, can be shown to have little or no caus-

ative influence on the incidence of cancer. Roger Williams has recently written very convincingly on this point.

The study of cancer is now being pushed along much broader and more scientific lines than ever before, and this study, which includes the lesions occurring in widely different animal forms, will, I am convinced, lead, possibly sooner than most of us imagine, to a solution of the problem presented to-night.

TRANSACTIONS OF THE SECTION ON GYNECOLOGY—COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Meeting of October 19, 1905.

DR. GEORGE E. SHOEMAKER *in the chair.*

DR. BARTON COOKE HIRST presented a specimen and paper on

PSEUDOMYXOMA PERITONEI.*

DR. GEORGE M. BOYD.—The chairman will remember a case we had together at the Lying-in Charity some ten years ago, an old maid of about fifty, a domestic. She had a large ovarian cyst with degeneration. The cyst seemed to be intact at the time of removal and was found to be filled with gelatinous and mucous material and its appearance resembled much the picture Dr. Hirst shows. She made a good recovery after removal of the cyst, and for about two years was in good condition, when the abdomen filled again and she returned with a greatly distended abdomen. A second operation was performed and pseudomyxoma peritonei was found. Again the abdomen filled, and she finally succumbed to the disease.

DR. GEORGE ERETY SHOEMAKER.—These cases in diagnosis will have to be separated from the intraperitoneal incarcerated collections of straw-colored thick fluid which sometimes accompany peritonitis or salpingitis, and sometimes such collections occur in the quantities of two or three ounces in each loculus. The contained fluid, however, is very different from that described by Dr. Hirst. This particular form of incarceration I have not observed, as in the cases of ruptured cyst on which I have operated, no attempt has yet been made to organize or incarcerate the escaped contents. The other condition I have seen frequently and it is a very interesting one.

DR. EDWARD P. DAVIS presented a paper on

APPENDICITIS COMPLICATING PREGNANCY AND PARTURITION.†

DR. BARTON COOKE HIRST.—I have had considerable experience with the operative treatment of appendicitis in preg-

*See original article, page 345.

†See original article, page 351.

nancy, every year for the last four or five years having from three to five such cases. The chief lesson experience has taught me is, that the earlier the operation is done in pregnancy, the better the result. The problem which has troubled me most, but which I think experience has solved for my future conduct, is the manner of operating late in pregnancy. Operation early is easy enough. The incision may be lateral or median, as preferred. The uterus is not large enough to be in the way; but the abdomen cannot be explored late in pregnancy through a lateral incision, and therefore it is impossible to be sure that an abscess or some inflammatory condition in some other part of the abdomen, remote perhaps from the appendiceal region, is not overlooked. The only way to operate late in pregnancy, if there is, interperitoneal suppuration, or a suspicion of it, is to make a long median incision, turn the womb out of the abdomen, remove the appendix and then investigate the abdominal cavity thoroughly.

My experience has made it certain that I shall never again return the pregnant uterus after the seventh month within the abdominal cavity. In such a case I shall do a Cesarean section as part of the operation for appendicitis. Twice I put back the pregnant uterus near term, not wishing to complicate the appendiceal operation by Cesarean section, and both times I had reason to regret it. The abdominal walls retract so much that there is not enough room for the pregnant uterus in the abdominal cavity when the attempt is made to return it. In one case the woman died a few days after the operation from thrombosis of the ovarian vein and complete obliteration of the circulation on the left side of the uterus in the broad ligament. The cause of death was toxemia from necrosis of all the structures in the left broad ligament. In the other case the tension was so great that the wound burst open.

The two most valuable lessons, therefore, which my personal experience has taught me about operating in pregnancy for appendicitis are to always operate early in pregnancy, if possible; and, at this period, to operate if one is in doubt as to whether the case really requires operation, so as to avoid the necessity of operating later in gestation when the operation will be much more serious. I would rather make the mistake, if a mistake must be made at all, of operating on comparatively slight indications early in gestation, than to have the operation forced upon me near term when it is exceedingly embarrassing. If compelled to operate late in gestation, unless the lateral incision suffices and there is no suspicion of intraperitoneal suppuration, I should unite a Cesarean section with the appendiceal operation. But I would strain a point late in gestation, to defer the operation until after delivery.

DR. W. REYNOLDS WILSON.—Dr. Cragin of New York has brought attention to the occurrence of acute pyelitis occurring during pregnancy. It occurs to me that the symptoms might

resemble those of appendicitis in the later months of pregnancy. I cannot remember the paper sufficiently well to recall on what he bases his diagnosis. The pain, I imagine, in the two conditions is so alike that it would be a mistake to make a negative diagnosis relative to appendicitis. Taking the appendix would be the only proof of what the condition was. The subject is very interesting, because there are certain cases in which right-sided pain is marked and yet the condition is not appendicitis.

DR. WILMER KRUSEN.—I have had opportunity to operate upon five cases of appendicitis complicating pregnancy. The first of these was in a woman about two months pregnant. There was recovery without abortion. Two other cases were between the fourth and fifth months of pregnancy; one was suppurative, the other non-suppurative. Both went to term of eight and one-half months pregnancy. Pain and vomiting brought about the labor at this time. In one case the abscess sac was opened about two days after labor. It is remarkable that labor should have taken place without rupture of pus sac. In one case only, the fifth, did premature labor occur.

DR. DAVIS.—In a paper read about two years ago before the American Gynecological Society, Dr. Craigin described pyelitis complicating pregnancy. He based his diagnosis upon the character of the fever, pain extending down along the ureter, the examination of the blood for leucocytosis, the examination of the urine and palpation of the urinary tract. By these means he was able to distinguish in his cases between pyelitis and appendicitis.

In one of the cases reported, the patient, during her first pregnancy, had pain referred to the right side of the abdomen. She was seen in consultation by a surgeon who thought she had a mild attack of inflammation of the gall-bladder. The appendix was not suspected at that time. It was subsequently removed, however, and found to be diseased.

The assertion of Fûth and Zweifel that in appendicitis complicating pregnancy, pain is referred high in the abdomen and even upon the left side, is one of practical interest. Such location of pain might readily mislead in diagnosis. In my observation, the pain of salpingitis on the right side is usually referred to the region of the Fallopian tube.

DR. GEORGE ERETY SHOEMAKER reported a case of

SARCOMA SECONDARY TO FIBROMA OF THE UTERUS, ASSOCIATED WITH ACUTE SOFTENING OF ANOTHER NODULE.

The importance of the malignant degeneration of fibromata of the uterus and the questions which arise in dealing with such tumors make the following case worthy of record.

K. D., married, a patient of Dr. James Aiken, of Berwyn, Pa., aged 42 years, housewife, was admitted October 16, 1905.

and discharged November 16, 1905. She had one child, 10 years old. No miscarriages. Menses began at 13; were regular, lasting twenty-eight days. Duration, six days, quantity normal. Pain before flow, ceasing at beginning of flow. This early type was preserved through life, except that after the child was born, pain was much less. Last period was seen as usual, two weeks before admission. Six months ago she began to have bearing down and discomfort in the right lower abdomen, especially at night.

Three months ago she first noticed a tumor, which has rapidly grown since. One week ago, after a long walk, severe dull, throbbing pain began in the right side. For the past four days she has been in bed with weakness, rapid respiration, some fever and some vaginal discharge. Transportation to the hospital considerably exhausted the patient.

On examination there was found slight cyanosis of face and extremities. Respiration ranged from 48 to 36. Pulse was of poor volume. A hard, irregular tumor extended from the pelvis into the epigastrium, movable from side to side above, but impacted in the pelvis, and inseparable from the uterus. The cervix was extremely soft and a little enlarged. Extending backward toward the sacrum was an edematous soft portion of the tumor which resembled an incarcerated pregnancy, but the normal menstruation and doubtful breast signs with other conditions led to the abandonment of that theory.

Under a diagnosis of degenerating fibroma of the uterus, abdominal section was undertaken. There were no adhesions. The top of the uterus, which was but little enlarged, was located by tracing the round ligaments and tubes. It was buried between two principal masses, one of which, about five inches in diameter, was wholly within and under the right broad ligament, extending around in front of the cervix. The other sprang upward from behind the uterus, extending into the upper abdomen. It was the latter higher growth which was afterward proven to be sarcomatous. The other, the intraligamentary portion, was undergoing acute softening, was edematous, and when cut, after removal, brownish watery fluid escaped from interstices. It almost appeared to fluctuate. The ovarian vessels were tied just below the ovary on each side, but this tie on the right was above the tumor mass. Both elongated round ligaments could be tied. The higher sarcomatous mass could be partly delivered, but neither the uterus nor the lower tumor could be brought through the wound. By serial ligation down the left side, the neck of the uterus was reached and a soft, thick edematous flap of peritoneum pushed down with the bladder in front. The cervix was cut across and the masses rolled out toward the right from below. After sewing the stump across, there was little trouble from oozing, though a number of points required a ligature.

As the patient's condition was poor and the cervical portion

appeared sound, it was decided not to remove the cervix. At this time sarcoma was not demonstrated, though discussed, and the thick, edematous peritoneum about the bladder was considered quite as dangerous as the cervix, if the only risk were acute softening, yet the former could not be removed.

The wound was closed without drainage after leaving a quantity of salt solution in the abdominal cavity. Both ovaries and tubes were removed with the uterus. The appendix was not disturbed.

The presence of acute degenerative changes in fibroma always increases the risks, but the recovery of this patient was complete without suppuration, though the wound was dressed for observation more frequently than usual. There was a copious flow of urine in the first twelve hours, thirty-two ounces being withdrawn by catheter. There was some vomiting for two days, nutritive enemata being resorted to. The highest temperature was 101 on the fourth day. The pulse was easily excited for several days and varied greatly within short periods, but the patient rapidly recovered strength and in three weeks was out of bed with a healed wound.

Examination of the specimen showed solid, irregular tumors, weighing about five pounds. At a point on the surface of a large fibromatous mass, which sprang from the posterior surface of the uterus, and which had lain in the epigastrium of the patient, was an area three inches in diameter, where whitish-yellow points a line in diameter appeared to be thrusting up the otherwise smooth peritoneal covering of the growth. A section removed at this point showed typical sarcoma when microscopically examined in the laboratory of the Presbyterian Hospital, by Dr. J. D. Steele, while the chief portions of this and the other tumors were fibromatous in character. The sarcomatous patch appeared as a local degeneration of the other growth.

TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF LONDON.

Meeting of December 6, 1905.

The President, W. R. DAKIN, M.D., F.R.C.P., in the Chair.

VENTRAL FIXATION OF THE UTERUS AND ITS ALTERNATIVES.

DR. G. ERNEST HERMAN opened a discussion on this subject. He distinguished four classes of cases in which ventral fixation is useful.

1. Retroflexion without appreciable descent, but with tenderness of the uterine body, not relieved by mechanical support. In these ventral fixation, Alexander's operation and vaginal fixation are equally effective; but ventral fixation is to be preferred.

2. Adherent retroflexion of the uterus with tenderness. Here ventral fixation is the only treatment so far as the displacement is concerned. But it must be advised cautiously (*a*) because the tenderness may be due to the condition of the peritoneum; (*b*) because many of these patients are neurasthenic, and from either of these causes the operation may not be an immediate therapeutic success; (*c*) because in these cases it is more dangerous.

3. Retroflexion without tenderness of the uterus, but with descent. Here ventral fixation is the only effective surgical treatment. But mechanical support if effective is to be preferred. Many of these patients are neurasthenic; and for that reason the immediate result of the operation may be therapeutically a failure.

4. Prolapse of uterus and vagina. Here ventral fixation is therapeutically a failure unless accompanied with elytrorrhaphy. *Plus* elytrorrhaphy it is successful.

The author considers ventral fixation less dangerous than Alexander's operation, and more surely permanent than vaginal fixation. He considers the objections to ventral fixation, which are: the dangers of sepsis, peritonitis from tension of the peritoneum, pulmonary embolism, parametritis, suppuration in suture tracts, tenderness of the scar, hernia, intestinal obstruction, difficulty and danger in subsequent labor. He thinks that if properly performed ventral fixation does not interfere with subsequent pregnancy or labor; and there is reason to think it may prevent miscarriage.

DR. HORROCKS said that he could agree with practically all that Dr. Herman had said, but he considered that this operation was resorted to far too often, partly because sufficient time and skill were not spent in trying to remedy the condition and partly because some men recommended and performed the operation without trying the effect of mechanical support at all. He considered that even when the uterus was well fixed to the abdominal wall it was an unnatural position which was not unattended by danger. Further, sometimes the operation not only failed to cure the patient, but added to the old complaint a pain attributed to the scar and due, no doubt, to the dragging of the adherent uterus. And, unfortunately, in those cases where, owing to adhesions, the uterus could not be restored and maintained in position by mechanical means, the operation became much more difficult and dangerous. For these reasons, he considered that ventral fixation was an operation only to be resorted to in a few cases when all other means had failed.

DR. GALABIN said that he agreed with a large part of what Dr. Herman had said as to the scope of the operation of ventral fixation, but personally, he preferred intraperitoneal shortening of the round ligaments in some of the classes of cases referred to, and particularly where future pregnancies were probable. This operation was not open to the same objections as Alexander's op-

FIBROMA OF OVARY.

MR. ALBAN DORAN showed a fibroma of the right ovary which weighed 17 lbs. The patient had been under observation for 10 years prior to the operation for its removal. Its presence was associated with ascites and with some adhesions to omentum and bowel. It seemed to have rolled forward and to the opposite side some years before its removal. No evidence of malignancy could be detected in it.

FIBROMYOMA OF UTERUS.

MR. ALBAN DORAN showed a specimen which he had enucleated from the uterus in the second month of pregnancy. The patient went to term. The liquor amnii was excessive and the breech presented. The child was born alive and weighed 7 lbs.

TUBAL ASSOCIATED WITH INTRAUTERINE PREGNANCY.

DR. HEY GROVES showed a ruptured tube, removed 5 weeks after the last regular period. The intrauterine pregnancy pursued a natural course.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Contribution to the Therapeutics of Retroverted Pregnant Uterus.—Giovanni Rizzatti (*Ann. di Ostet. e Gin.*, Nov., 1905) describes the methods for replacement of the retroverted gravid uterus made use of by Fabri in the University clinic at Modena. The obstacle to reduction that presents itself on account of negative pressure is obviated by the introduction of air into the rectum by means of a catheter, or by insufflation of air mechanically. The patient is placed in the knee-elbow position while the replacement is going on, and the weight of the uterus tends to drag it into place, while the reduction is completed by bimanual manipulations. In severe cases it is necessary to use a manual replacement with pressure on the organ itself. The uterus is a spheroid at this period of pregnancy, with a transverse axis, and it is necessary to revolve it upon this axis; by moderate pressure on the fundus in a direction parallel to the sacral curve, while the neck is drawn upon by the fingers of the other hand or by forceps, the uterus is made to revolve on this axis. The author states that this method of replacement has been successful at the clinic in Modena, and recites the history of several cases in which a normal pregnancy went on after replacement. If pregnancy has not gone further than three and a-half months it is best to insert a pessary to prevent recurrence of the displacement.

Abnormal Adhesions of the Placenta.—Brindeau and Nattan-Larrior (*Bull. de la Soc. d'Obst. de Paris*, Nov. 16, 1905) discuss the origin of placental adhesions in the light of modern pathological researches. They find that the adhesions result from an intimate union of the placenta with the uterus and an atrophy of the fetal envelopes, often the result of endometritis extending to the muscular layers of the uterus. The spongy layer of the placenta is absent and the muscle exfoliates and is drawn away with the placenta. There is often an adhesion of a supplementary cotyledon, which is total, and the membranes are adherent as well. The real cause is an atrophy of the fetal envelopes, so that the placenta is inserted directly on the uterine muscle. The muscle which comes away with the placenta has not its normal appearance. Many of the villi are absent, and the fetal portion of the placenta is thinned, the spongy layer being absent. The superficial layer is poor in cellular elements; bands of muscle interlace with the decidual cells and the muscular fibers are found to have undergone degeneration, necrosis and vacuolation.

Glycosuria in Pregnancy and the Puerperal State.—Bini (*La Riforma Medica*, Jan. 20, 1906) tells us that glycosuria in the pregnant or puerperal woman is rare. When found it is a true glycosuria, glucose being present in 27 out of 29 cases. While glucose and lactose appeared in two puerperal cases, two cases showed lactose alone. The glucose disappears rapidly, while lactose remains for some time in the nursing woman, disappearing after a few days in those who do not suckle their children. The author believes the glycosuria to be of a spontaneous alimentary nature, due to alteration of the metabolism of the organism, generally dependent on intoxication of pregnancy directly, and indirectly on alimentary troubles, dyscrasia, etc.

Albuminurias of Pregnancy.—V. Wallich (*La Presse Méd.*, Jan. 6, 1906) distinguishes two common types of albuminuria of pregnancy: that found with the kidneys of Bright's disease which existed before pregnancy and in which the albumin comes from the old lesions, and the true gravidic albuminuria, resulting from autointoxication, which results from an acute condition of the kidneys, varying from simple congestion to hemorrhages of the kidney accompanied by eclampsia. The first form is easy to recognize since albumin persists between pregnancies, and there are other symptoms, especially those related to the heart. There is a third form that is more rare and less often recognized, the albuminuria of pyelonephritis, the signs of which are pus in the urine, polyuria and previous symptoms of urinary troubles in most cases. There is microscopically a large number of white cells, which make a thick deposit on the bottom of the flask, and which give a peculiar reaction with ammonia. The author examined the urine of fifteen women during two months, and in six of them found a history of previous urinary troubles. All of them had per-

sistent albuminuria. There were two distinct types of urine, those which remained clear and those which were hazy. In the cases in which the albuminuria arose from suppuration there was a great contrast in symptoms with those from other causes: there were no edema, no visual trouble, no epigastric pain, and no lesion in the placenta, while a well-formed fetus was delivered. But there were polyuria, frequent micturition and purulent urine. The milk diet is the proper treatment for both classes of cases.

GYNECOLOGY AND ABDOMINAL SURGERY.

Indications for the Extirpation of the Adnexa in Connection with Hysterectomy.—G. Miranda (*Arch. di Ostet. e Gyn.*, Oct. 1905), after a comprehensive clinical and anatomo-pathological study of the functions of the ovaries and their relation to the menopause, gives the following conclusions as to the advisability of their preservation or removal in cases of hysterectomy. The studies of the functions and secretions of the ovary do not yet render it possible to formulate the effects of their removal on the organic processes of the body. Clinical observation shows that preserving the ovaries lessens the rapidity and the severity of the occurrence of symptoms due to the menopause, thus rendering the organism able to accustom itself gradually to the absence of their function; the atrophy of the ovaries is slow and gradual. Experimental and anatomo-pathological examinations support this view of their preservation. There are certain dangers and inconveniences due to their preservation which counterbalance the advantages of the method. The ovaries should never be left in hysterectomy for disease of the adnexa themselves, nor in disease of the uterus of malignant character, nor in 60 per cent. of myomata. Their preservation is especially to be recommended when the operation is done for the accidents of labor, excepting contracted pelvis and disease of the sexual sphere, in conjunction with a resection of the body of the uterus.

A Case of Syncytioma Malignum.—Odorice Viana (*Archiv. di Ostet. e Gyn.*, Sept., 1905) had the care of a woman of forty-two years, previously well, who after two months of amenorrhea began to have profuse metrorrhagia. She was curetted for postabortive endometritis. Two weeks later the discharge of blood returned and she complained of a body protruding from the labia. A swelling the size of a nut was found, covered with blackish-green mucous membrane. It was located on one labium and had no connection with the vagina. This was removed, causing much hemorrhage and not healing well. Hemorrhage from the uterus continued. It contained much fetid blackish material. The condition went on until the entire uterus was involved, the anemia extreme, and finally death supervened. The uterus was transformed

into a mass of new-growth, preserving its shape, but almost all muscular structure had disappeared and the mass consisted of hemorrhagic material, infiltrated diffusely with round cells. Among these were lacunæ containing abundant syncytial elements. The clinical course and the examination showed this to be a typical syncytioma. Its occurrence after a probable pregnancy, the long continued, severe metrorrhagia, the characteristic vaginal and pulmonary metastases, the progressive failure of the patient, and the uterine lesions all correspond to this species of tumor. In the formation of this tumor, there is, during pregnancy, a general tendency of the maternal organs to be transformed into elements resembling syncytium. A similar structure is also found in children as well as in the male.

Rare Ulcers of the Vagina.—Vautrin (*Ann. de Gyn. et d'Obstét.*, Sept., 1905) describes a rare form of round ulcer of the vagina, superficial, involving only the mucosa, not indurated or undermined, not high-colored or surrounded by an arcola, with no inflammation of surrounding parts; it has a red base, covered with thick, odorless pus. It is always located in the posterior vaginal cul-de-sac. It appears unnoticed by the patient, who complains of little pain, simply of the secretion. It may occur in persons of advanced age, affected by arterio-sclerosis, when it is supposed to be due to the changes in the circulation. Here it is generally found by autopsy. It may also occur in young persons who are debilitated. It appears not to be of bacterial origin. The author thinks it can hardly be due to irritation of confined secretions in the vagina. In young persons it is probably due to vaso-motor disturbances, the result of a hysterical or nervous condition of the patient. There is a lack of nutrition in some spot, a detachment of the epithelium, and the appearance of an ulcer, which does not tend to heal except under local stimulation, combined with antiseptic douches. It must be distinguished from tuberculosis, syphilis and gonorrhea, where a bacteriological examination is useful. Another ulcer observed by the author began as a gangrenous spot, which extended and healed at opposite borders, until it had involved a great part of the vagina, and had hidden the cervix entirely in its cicatricial masses.

Elevation of the Pelvis in Spinal Anesthesia.—Richard Freund (*Zent. für Gyn.*, Sept. 30, 1905) says that the first attempts at anesthesia by injections of cocaine into the spinal canal took place in 1901, Trzebicky getting serious cocaine poisoning from its use. Since the cocaine has been combined with adrenalint and tropacocain has been used, the results have been excellent, Stolz, in the Graz Hospital for Women, has done laparotomy under this kind of anesthesia. The only bad effects were slight headache, vomiting and rise of temperature. The best com-

bination is that of Billon, which is prepared in glass tubes and contains .0013 c.c. of borate of suprarenin, .04 c.c. of stovaine, and .0011 c.c. of chloride of sodium in the entire mixture. Veit did two operations for carcinoma of the cervix under anesthesia with this mixture with the best results. The injections should be given with the patient on the side and the spinal column flexed, and the needle should be entered at the side of the third lumbar vertebra. A small amount of cerebrospinal fluid is allowed to flow out, and then the solution is injected slowly. It requires from 6 to 7 cgm. of the Billon mixture to secure perfect anesthesia below the waist line. The injection is given after the abdominal disinfection, and the pelvis is elevated. Anesthesia is perfect from the mamillary line throughout the lower extremities, in four to five minutes and lasts for one and a quarter hours. The author has observed two cases, one a woman of 55 years of age, reduced to a skeleton by carcinoma uteri; a radical operation under ether was considered impossible on account of the general condition of the patient. She required only a small amount of the solution to produce anesthesia, and was bright and lively immediately after the operation. She felt only a sensation of drawing at the time when the organs were removed. Had she taken ether the poisoning of the blood, the vomiting and other bad effects would probably have been fatal in her weakened condition. Neither patient had any bad effects from the anesthesia. Heart, lungs and intestinal canal are free from poisoning by this method. Shock, which is really an effect due to the anesthesia, is entirely absent. The author advocates the use of spinal anesthesia in all elderly women for cancer of the uterus, as well as for other gynecological operations. It is an epoch-making improvement for all pelvic operations.

Bilharzia Infection of the Female Genital Organs.—Carl Goebel (*Zent. für Gyn.*, Nov. 11, 1905) discusses the frequency of infection of the female genital organs with Bilharzia hematobia. The disease is common in Egypt and generally attacks the bladder and rectum, but may also produce polypoid growths on the vulva and in the vagina of the female. The author believes that this seldom occurs, inasmuch as, out of more than three hundred cases of Bilharzia infection treated by him in Breslau there were no cases of infection of the female genitals. The author finds only two cases in literature, by Frank Milton and Madden. The bladder is more frequently attacked. Any portion of the vagina or labia may be attacked, but the labium minus is the most frequent location. There follows, according to Milotn, an affection of the connective tissue and retraction of the labia, which he calls the atrophic form. Madden's case belonged to the hypertrophic form, there being a pendulous growth, which produced no symptoms except slight burning on micturition, menstruation being regular. Bladder, rectum and urethra were free from disease, so that this was a true primary affection

of the vagina. The author describes a case represented by an anatomical specimen from the Medical Museum of Cairo, in which there was a papillomatous growth of the cervix uteri, which resembled a malignant tumor, but was caused by Bilharzia. The whole vagina was filled with these masses, but there were no ulcerations or foul discharge, as there would have been in malignant disease of the uterus. The treatment of such cases consists of excision of all the diseased tissues. The prognosis of primary Bilharzia infection of the vagina is good, while a general infection often results in serious symptoms which cause death, the bladder and even kidneys becoming diseased. It is interesting to trace the method of infection of the vagina. The eggs of the parasite are passed in considerable numbers in the urine and, they may also be emptied out with the semen, so that cohabitation might be considered to be the source of communication. It is questionable whether the embryo loses its covering in the vagina so as to be able to move about. The entrance of the miracidium through the skin is more probable.

Tuberculosis of the Female Genital Organs.—Oscar Nebesky (*Monatsschr. für Geb. u. Gyn.*, Nov., 1905) says that tuberculosis of the genital organs among women is much more frequent than has been generally supposed, and in the country and in small cities is the cause of the larger number of inflammatory lesions of these organs. There are several views as to the cause of the affection. Some regard it as always secondary, while others contend that the infection is primarily one of the genitals themselves. The tubes are most often the seat of the infection. The subjective symptoms of most importance are amenorrhea, sterility and leucorrhea. The prognosis depends on the involvement of other organs, early diagnosis and treatment, and the position of the patient and her ability to obtain the best conditions for recovery. When the tuberculosis has involved the peritoneum primarily the operation is more difficult and mortality larger. Some believe that only the expectant treatment, with feeding, change of climate and hydrotherapeutic treatment should be used. Others advise immediate radical operation, removing all the diseased organs whenever the lesions are localized. The author describes a case operated on by him in this way, in which the uterus and tubes were alone affected, and eighteen months after the operation the patient still remained well.

Occurrence of Spirochæte Pallida in Syphilis.—Roscher (*Berl. Klin. Woch.*, October 30, November 6 and 13, 1905) gives us the results of examinations made in 100 cases of syphilis in the Clinic of the University of Berlin. Of these, 92 had had no treatment, and were more or less early cases, while 8 were recurrences in the first year of the infection. In all, 206 syphilitic lesions were examined, with 184 positive and 22 negative results. There were 32 primary affections, 4 extra-genital.

In 31 cases spirochæte pallida were found. In 16 of them secondary affections had not yet appeared. There were 38 gland punctures, 30 positive, 8 negative. The serum of growing papules was examined in 58 cases: 37 from the genitals, 11 from the toe, 7 from about the anus, etc. Spirochæte were found in all but three cases. Papulo-crustaceous lesions were examined 40 times, 34 times positive. Mucous patches were examined 30 times, with positive results. In preparations from these same patients not coming from syphilitic lesions, no spirochæte was found. In 14 cases of relapses only three times was spirochæte pallida found. In typical tertiary processes no spirochæte was found. Possibly they may exist in another form. In 24 non-syphilitic cases examined, spirochæte was never found. In early cases of syphilis, therefore, spirochæte is constantly found, while absent in cases of other diseases.

Use of Gloves in Obstetrical and Gynecological Work.—Vincenzo Caliri (*Ann. di Ostet. e Gin.*, Nov., 1905) details his experiments as to the possibility of obtaining a perfect sterilization of rubber gloves to be used in operative procedures, by the means ordinarily used. He found that nearly all antiseptics excepting corrosive sublimate failed in this respect, and that broth cultures made after sterilization showed the presence of microorganisms of various kinds. Alcohol was open to this objection, and at the same time injured the rubber, which became softened. The best method found was that of simple washing of the gloves with soap and water for some minutes, followed by the use of a one per cent. solution of corrosive sublimate. The use of the autoclave gave perfect sterilization, but it greatly injured the strength of the glove. Soap and water and sublimate injured them least of all. They became in most processes permeable to bacteria from the hand as a result of changes in the physical composition of the rubber. The author also found that the gloves lessened the accuracy of touch in the operator. He concludes that the operator need not have the ends of the fingers covered by the gloves, while it is a distinct advantage to have the forearms and the rest of the hand covered, the last two phalanges being left exposed. The other persons assisting should wear gloves that cover the entire forearm and hand.

Hot-Air Treatment of Pelvic Inflammations.—Ph. Jung (*Munch. med. Woch.*, Dec., 1905) gives the results of the treatment of various forms of pelvic inflammation with the hot-air apparatus of Polano, which he thinks should be heated by electricity, in order that the patient may control the temperature if it becomes too high. He also recommends having the patient receive a cold rubbing before going home, to prevent catching cold. Under the author's treatment all possible cases are treated conservatively, incisions being made to evacuate pus when necessary, and the diseased organs being left in place to be treated by hot air after all fever has subsided. The heat produces resorption of exudates in all appropriate cases. He pub-

lishes results of 120 cases treated by this method. Of non-operative cases, with palpable exudate or inflamed adnexa, there were 23. Of these 2 were subjectively and objectively cured. Of cases without palpable exudate, but chronic adhesions, there were 42, 22 much improved, 14 with bad results, 3 doubtful. Of operative cases with adnexal tumors and results of purulent inflammation 15 were treated, 14 cured, 1 with bad result. Of post-operative stump exudates, 37 cases, 28 good results, 3 bad, the rest doubtful. In tuberculosis of adnexa poor results were obtained. The treatment is contraindicated in all acute conditions, or acute exacerbations of inflammatory conditions of long standing, in abscesses with hard exudates about them, in tuberculosis, and in heart lesions with poor compensation. In most of the cases treated the exudates vanished, while the frequent handling necessitated by other conservative treatment was done away with.

Enteroptosis.—P. Mathes (*Arch. f. Gyn.*, Bd. 77, H. 2), after a careful study of the cases of enteroptosis appearing at the gynecological clinic at Gratz, sums up the results of his observations thus: Enteroptosis is a constitutional and hereditary anomaly of the abdominal organs, consisting of a weakness and absence of vital energy in the whole body. The changes in the position of the abdominal organs are due to the insufficiency of the hypoplastic, sunken thorax, and secondarily to the weakness of the abdominal walls. The abdominal organs are supported entirely by their ligaments and the abdominal walls, while in a normal thorax the suction power of respiration is a great factor in their retention in place. The position of the body and the expression of the face betray the abnormal condition. The dorsal vertebræ bend forward, the normal lordosis of the lumbar region is absent, and the abdomen with its long axis continuous with the long axis of the thorax forms an open funnel. The pelvis is only slightly inclined, and the face has a juvenile character. The enteroptotic habit is identical with the phthisical habit. The symptoms depend on the degree of anomaly. The more severe this is the sooner will symptoms appear. Chlorosis in such girls is a result of enteroptosis. Other contributing factors in these cases are wasting diseases, pregnancy, labor and the puerperal state, tight lacing, mental and bodily overwork, poor nourishment and bad conditions of living, acute and chronic psychical injuries, lesions of the genital organs, and especially gynecological diseases. The symptom complex of retroversion, prolapsed kidneys, and enteroptosis is the same. The peritoneum of such women is very vulnerable, and pain is increased by genital troubles. Enteroptosis is a modern disease. The treatment should be by all sorts of strengthening measures: gymnastics suitable to strengthen and enlarge the thorax, and reinforce the abdominal muscular power; in severe cases rest in bed and overfeeding. Many cases are benefited by a well-fitting abdominal support. The local treatment of

gynecological troubles is of least importance; prophylactic measures in the young are of the greatest.

Growth and Changes of Submucous Myomata.—J. A. Amann (*Monatsschr. f. Geb. u. Gyn.*, Jan., 1906) draws attention to the various changes that take place when submucous myomata are allowed to grow to a large size. According to many authorities, these tumors never become very large, not larger than a fetal head. The author's experience has included several cases in which they had grown to a much greater size. He describes two of these tumors, in one of which the abdomen was the size of a six months' pregnancy, while by vaginal examination it was impossible to find any uterus. The operation showed that the tumor had a long pedicle which grew on the posterior uterine wall, and that the tumor was entirely outside of the uterus, which formed a small protuberance on its anterior portion. The vagina was immensely distended and the tumor filled the entire pelvis and lower abdomen. In the other case a complete inversion of the uterus had taken place, and the tumor had become prolapsed outside of the vagina. The adnexa are frequently affected by absorption of products from the tumor, through the lymphatic circulation, causing the adnexa to become the seat of abscesses. Ulceration may also take place on the surface of the tumor, and the growth become adherent to the wall of the vagina. The growth becomes edematous and dilates the cervix, especially during menstruation, and after this function it again shrinks, and the cervix closes, so that there is an intermittent polypus. Another complication that sometimes takes place is degeneration of the cervix into a carcinomatous growth as a result of friction against the tumor.

DISEASES OF CHILDREN.

Surgical Intervention for Intracranial Hemorrhages of the New-Born.—Four such cases were operated upon by Harvey Cushing (*Amer. Jour. Med. Sci.*, Oct., 1905). Case 1. Extensive subdural hemorrhage, probably unilateral, operated upon three days after birth; death eight hours after operation. Case 2. Fever and unilateral convulsions on the fifth day. Subdural hemorrhage. Perfect recovery. Case 3. Subdural hemorrhage, cavernous sinus thrombosis. Apparent recovery, with blindness of right eye, though sufficient time has not elapsed to determine the eventual mental status. Case 4. Very extensive unilateral subdural hemorrhage. Death during irrigation to remove blood. The new-born child, says the writer, will stand a cranial operation well. The cases reported were operated upon under most unfavorable circumstances. The intervention should have taken place at least a day earlier in each instance, and the surgeon should have refrained from attempting too much at one sitting. The author also believes that the coagulation time is as short in the infant as in the adult,

so the argument that fatal hemorrhage from the incision will result is invalid. In two of the cases symptoms definitely pointing to intracranial trouble did not appear or were not noticed until several days after birth. Careful study of the symptomatology will perhaps enable us to recognize the conditions earlier and permit operation before the damage has become too extensive or permanent.

Surgical Interference in Tuberculosis of the Meninges and Brain.—M. H. Duret (*Four. des Sci. Méd. de Lille*, Oct. 28, 1905) concludes his observations on the subject of surgical treatment of tubercular meningitis with the following résumé: The condition is the result of a generalization of the disease in the nervous system, but in certain cases the curability by surgical means has been established. When the germs have not penetrated deeply a cure is possible, when an early diagnosis has been made. Repeated punctures in acute meningitis by their results give reason for hope. In meningitis due to otitis or sinus disease some good results have been obtained. Interference is also of value in acute traumatic meningitis. There is no absolute contraindication to surgical interference in diffused meningitis, especially of tubercular origin. Interference, if undertaken early, under aseptic precautions, with drainage of the arachnoid spaces, lumbar and ventricular puncture and irrigation may succeed in some cases. We should not operate in despair, but should seek precise indications. In localized tuberculosis of the nerve centers in children, do not operate in haste, on account of the many lesions and the visceral complications. In adults the results are better. When there is a single localized tubercular tumor it should be removed.

Convulsions in Early Infancy.—John Thompson (*Practitioner*, Oct., 1905) divides the common types of infantile convulsions into five classes: (1) In those from birth injury the treatment is purely expectant, keeping the infant quiet and warm and favoring nutrition. (2) Those from dyspepsia require regulation of diet, modified and peptonized milk, with calomel, antacids and lavage, but a wet nurse is best. (3) "Idiopathic convulsions" are simply those whose cause is undiscovered. They begin in early infancy, are severe and prolonged, usually increase in frequency and may reach 20 or even 40 in a day. Chloral must be used in full doses. For the youngest babies gr. i every two hours, and for children of one or two months gr. i-ii is not too much. The drug should be continued until fits have ceased for 24 to 36 hours, and then be gradually diminished in frequency. If the first dose is not enough it should be increased until the baby is almost too drowsy to swallow. Feed carefully to avoid inhalation pneumonia. Usually, after chloral is given for three or four days at most, the fits do not return. (4) Convulsions from rickets require proper diet, cod-liver oil with or without phosphorus, and fresh air. (5) From cerebral defect, do not usually respond

permanently to treatment. Country life, tonics, and some times thyroid extract may help.

Convulsions in Children.—In an interesting paper on this subject, by Edmund Cautley (*Clin. Jour.*, Sept. 6 and 13, 1905) makes the following suggestions as to treatment: As soon as a fit starts the child should be laid down with the head a little raised, and the clothes loosened or removed. Avoid all disturbance. A bath at 95° to 100° F. may be given, especially in cases due to colic, but not in fits due to syncope or collapse of the lung. Cold affusions should be applied to the head while in the bath. Chloroform is given to allay the spasms, and the alimentary tract is treated. The large intestine may be irrigated with saline solution or a glycerin enema given. After the bowels act, chloral hydrate gr. iii-x, according to age, should be given by rectum. Double the quantity of potassium bromide may be combined with this. Repeat the chloral in an hour if necessary. If it is not retained, morphine gr. 1-20 may be given hypodermically to a child of six months, repeated in an hour if needed. Chloroform is given until the chloral begins to act. If there is evidence of unsuitable food in the stomach induce vomiting by tickling the fauces. Calomel should be given as soon as the child can swallow. Do not give emetics at this stage, as vomiting may induce another fit. Lancing the gums may prove beneficial as a mode of bleeding if there is cerebral congestion, due to asphyxia. Leeches are of use in uremia in older children, but children do not stand bleeding well. Active treatment can be discontinued when the secretion of urine becomes abundant. After the attack the child must be kept quiet for a few days, on light diet, the bowels regulated, and moderate doses of bromide given, combined with chloral, if necessary, or urethan instead. Belladonna and valerianate of zinc may be combined with bromides. When there is a definite disease this should be treated, and all sources of reflex irritation should be attended to. The drugs most useful in the prevention of infantile convulsions are cod-liver oil, malt and iron, acting by improving the general condition. For epilepsy in older children the bromides should be given for at least two years, and may be combined with salt starvation. Constipation must be remedied, intestinal antiseptics given if necessary, and the diet be plain and unseasoned, and contain little meat. Out-door life with physical exercise is best.

Papilloma of the Larynx in Children.—J. P. Clark (*Bost. Med. and Surg. Jour.*, Oct. 5, 1905) says that this is a very serious condition, the cause of which is unknown. He lays down as a fundamental proposition that these growths will not yield to any form of treatment which has been attempted, however radical, until the period of active growth has passed. Cases of rapid recurrence appear to belong exclusively to childhood. The best method of treatment in all cases during this period is tracheotomy and non-interference with the growths. If, under

this treatment, it still persists after an age when the child can be treated as an adult, it has probably lost its activity of reproduction, and attempts at its removal may be made. The paper includes reports of fourteen cases from the Massachusetts General Hospital records.

Deaths After Exploratory Puncture of the Chest.—The aspirating needle is so frequently employed for diagnostic purposes in cases of disease of the chest that the accidents and even fatalities which may attend its use are often forgotten. An instance of sudden death after insertion of a needle for supposed empyema is recorded by J. H. Wilks (*Brit. Jour. Child. Dis.*, Oct., 1905). The child was three years old. While in the recumbent position a puncture was made in the eighth space just below the angle of the left scapula, and a few small flakes of curdy pus were withdrawn with some blood. Immediately afterwards dark blood issued in a continuous stream from the needle; the child coughed and expelled some blood from the mouth. The needle was withdrawn at once, but the pupils dilated, the sphincter ani relaxed, the hips changed color and breathing ceased. Artificial respiration and stimulation failed. The autopsy showed many small tubercles over the left lung and a needle puncture into the partially-consolidated lung tissue, which contained small caseous foci. The smaller bronchi were occupied by blood clots and pus, and the larger bronchi and trachea contained blood-stained mucus. The stomach contained dark blood, partly clotted. The heart muscle showed cloudy swelling. The amount of blood lost was estimated at not more than six ounces. The death was apparently due to cardiac failure in a patient debilitated by tuberculosis. An editorial in the same number of this journal (*Brit. Jour. Child. Dis.*, Oct.) contains references to a number of similar cases previously reported.

Surgical Treatment of Empyema.—D. M. Greig (*Edin. Med. Jour.*, Oct., 1905) discusses this subject, presenting the statistics of 100 cases treated by partial removal of one or more ribs, and comparing the results with 29 cases in the records of the Dundee Royal Infirmary from 1880 to 1890 inclusive, which had been treated by aspiration, aspiration followed by incision, or incision. Fifty-two per cent. of his own cases occurred in children. In the cases cited the mortality was: after aspiration, 87.5 per cent.; after aspiration followed by incision, 62.5 per cent.; after incision alone, 33.3 per cent.; after excision of ribs, 25 per cent. In cases where ribs were removed a second operation is required in 10 per cent.; where this was not done, one was necessary in 66 per cent. In hospital cases treated otherwise than by resection of ribs the average stay in the institution was 108 days; it was 68 days in cases with resection of ribs. In straight forward cases, without complications, in a young adult or child, the average duration of the wound after operation was 53 days.

Pleural Effusions in Children.—C. F. Waliver (*Four. Amer. Med. Assn.*, Sept. 23, 1905) believes that the majority of cases of pleural effusion should be treated surgically. One-third of all cases are purulent and must be so treated; most of the others are serofibrinous, and while the effusions are often absorbed under stimulation, poultices, heat, etc., they would recover more rapidly under incision, because large fibrinous clots can be mechanically removed. With a purely serous effusion aspiration, repeated once or twice if necessary, will usually lead to rapid recovery.

Typhoid Fever in Children.—Any step, says W. C. Hollopeter (*Four. Amer. Med. Assn.*, Sept. 23, 1905), which will lessen the toxemia in typhoid, may be regarded as a step toward a specific treatment. He strongly urges the performance of enteroclysis, which will reduce toxemia, lower temperature, and supply fluid to the body. The temperature of the colon irrigation is governed by that of the child. If tympanites is marked bicarbonate of soda may be substituted for saline solution, or tincture of asafetida or turpentine may be added. If peristalsis is increased the frequency of irrigations must be diminished or starch or bismuth emulsion must be introduced. For hemorrhage the writer uses the cold enema with ice externally. He employs the ice bag to the head and hot water bag to the feet as a routine, with a tepid sponge night and morning.

Typhoid Epidemic Among the School Children of Deggendorf, 1904-05.—Tischler (*Munch. med. Woch.*, Oct. 24, 1905) gives an account of an epidemic of typhoid developing during December among school children of the poorer classes, who also went to a charitable institution for a daily dinner of soup. The cases began on December 23, and up to January 1 forty-eight cases had developed. Two cases had begun on December 10 and 11. From January 1 to March 18 eleven more children were taken sick. Two adults also took the disease. There were many abortive cases in the same families. Only such children sickened as went to the soup-kitchen in Deggendorf. In this institution the greatest cleanliness was observed, and there was no typhoid case. The materials of the soup were inquired into carefully, and it was decided that these were not responsible for the epidemic. The drinking water came from so many sources that not all of them could have been infected. Two hundred children went to the soup-kitchen, but only fifty were taken sick. Most of the cases began before Christmas, when many of the children went into the town to get new shoes and other garments. Typhoid bacilli were found in the stools of some of the patients, and it was certain that it was a true typhoid epidemic. The infective material may have been conveyed from the first children in various ways: by unwashed hands in walking cases: by soiled clothes, secretions, exertions, etc. The exact cause of the epidemic could not be ascertained,

but possibly the first germs were brought from the city on the feet of those who went there.

Intestinal Perforation in Typhoid Fever.—Six cases are reported by J. P. C. Griffith (*Amer. Jour. Med. Sci.*, Oct., 1905) on account of the relative variety of the accident and to illustrate difficulties of diagnosis. In none of the cases was a leucocyte count made at the time when perforation was suspected. Case I., although exhibiting abdominal pain, tenderness and distention, had at first no more of these than is common in cases of typhoid with tympanites. There was no initial fall of temperature or evidence of collapse. In Case II even the presence of typhoid fever was not suspected, the child apparently having pleurisy. Vomiting and abdominal pain were referred to an indiscretion in diet. In Case III the symptoms were clearly those of perforation, but temporary improvement caused a postponement of operation. In Case IV there were, at the onset, no collapse and no more distention, pain and tenderness than is common in typhoid. In Case V vomiting was only occasional, pain was temporary and not severe, collapse was absent, and during the twenty-three hours before death there was neither abdominal tenderness, distention nor pain. In Case VI there were quite severe abdominal pain, vomiting and weakness; temperature not noted. General condition then good for nineteen hours, when signs of peritonitis appeared. All cases died. The perforation was confirmed by operation in two, by autopsy in three others.

Intussusception in Infancy and Childhood.—In the discussion of over a thousand cases collected from the literature, J. H. Hess (*Arch. of Ped.*, Sept., 1905) says concerning treatment that the condition demands early diagnosis. Abstinence from all food and absolute prohibition of purgation are important. The question of sedatives such as opium must rest with the physician. Irrigation may be tried once or twice in properly selected cases under the following conditions: Preparation for immediate laparotomy in case of failure, complete anesthesia. Hot salt solution or plain water must be used under a pressure of not more than three feet, the fluid being left in the bowel not less than ten minutes. Contraindications to irrigation are: Recurrence after a previous complete or partial reduction; very acute and severe types of the disease, which result in early destruction of the bowel wall; signs of beginning gangrene or ulceration, evidenced by subnormal temperature, profound toxemia and other septic symptoms; enteric intussusceptions. Laparotomy should follow failure of irrigation without delay, beginning with attempted simple reduction from below upward. In irreducible cases he favors resection within the bowel if feasible, otherwise resection with end-to-end anastomosis.

Spontaneous Reduction of Intussusception.—In a case of invagination of the small intestine into the large, in a boy four

years of age, M. H. Richardson (*Surg., Gyn. and Obst.*, Sept., 1905) failed to reduce the intussusception by moderate traction. Enterostomy was then performed with the idea that spontaneous recovery might take place through sloughing of the invaginated intestine. Death occurred from purulent bronchitis nineteen days after the operation. The autopsy showed that spontaneous reduction of the intussusception had followed the operation and no signs of the trouble remained. The writer states that his mistakes were in not having tried moderate hydraulic pressure through the rectum, and in not having made greater efforts to reduce the intussusception when the abdomen was opened.

Appendicitis in Children.—C. N. Dowd (*Med. News*, Sept. 23, 1905) analyzes fifteen cases of appendicitis in children, showing that in them the rapidity and insidiousness of the disease are much greater; that the percentage of diffuse and general peritonitis is greater, probably because the omentum is less apt to enclose the inflamed appendix; that the pain is almost always present, but is more difficult to interpret; that the vomiting is almost always present and is frequently many times repeated; that the abdominal palpation in the majority of cases is as satisfactory as, or more satisfactory than, in adults, but in a few cases is absolutely misleading; that constipation is much less likely to be present; that they have a greater ability to deal with general peritonitis as adults do; that during the acute progress of the disease delay is more dangerous than in adults, because of the insidious course of the disease and the greater tendency to peritonitis, and immediate operation is to be advised.

Ultimate Results of Bloodless Reposition of Congenital Hip-joint Dislocation.—Frederick Mueller (*Med. News*, Oct. 7, 1905) presents the ultimate results of 33 cases operated upon by Lorenz in Chicago in 1902. Anatomical results were gained in 21 of these, whereas the number of subspinal positions following were 12. Among the anatomical results depressions of the head, which stood, after removal of the first cast, in suprapubic or pubic position, were necessary in 6 cases; function and motion in these patients became normal. Stiffness of the joint operated upon followed in 4 cases. All of these cases are improving under continuous treatment, so that good motion as an ultimate result can be assured. The cause of this stiffness was, in some cases, the advanced age of the children; in some others it was insufficient exercise while in the first cast. The 33 cases show over 60 per cent. of anatomical cures.

THE AMERICAN
JOURNAL OF OBSTETRICS
AND
DISEASES OF WOMEN AND CHILDREN.

VOL. LIII.

APRIL, 1906.

NO. 4

ORIGINAL COMMUNICATIONS.

THE PRESENT STATUS OF PELVIMETRY.*

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EVERY textbook of obstetrics devotes considerable space to the elucidation of the rationale and the technique of the various methods of pelvimetry; every teacher of obstetrics emphasizes the manifold advantages of pelvimetry and recommends the mensuration of the pelvis as an essential part of the routine examination of every pregnant woman. And what is the result of all these energetic efforts? It is practically nil.

If it would be possible to calculate exactly the proportion of the measured pelves to the total number of confinements in the hands of physicians who have been taught the art of pelvimetry, I do not doubt, the percentage figure would be found extremely low, probably so low that it would be justifiable to say: Pelvimetry is not practised, either by the general practitioner or by the obstetrician. The man who in accordance with the suggestions of his teacher, measures every pelvis certainly is a *rara avis*.

*Read before the St. Louis Medical Society.

How can this striking discrepancy between theory and practice be explained?

In my opinion the most important of the reasons for this evident neglect of an undeniably useful method of examination are the following: *The term pelvimetry is misleading. Most writers make unjustifiable and exaggerated claims for the utility and accuracy of the various methods of pelvimetry. The practical importance of an exact determination of the size of a pelvis, or more correctly, of the length of one or two of its diameters is generally overrated.*

All text-books define pelvimetry as the method of determining the size of a pelvis, and certainly the term implies this meaning. I do not know, however, of a writer who adds to this definition the statement that we do not possess such a method.

Our most valuable methods of internal instrumental pelvimetry permit us to measure only the length of the true conjugate with a satisfactory degree of accuracy. The antero-posterior and the transverse diameter of the pelvic outlet can be determined with a tolerable degree of exactness. Modern pelvimetry is thus practically limited to the mensuration of these three diameters. Roentgen-photography promised to solve the problem of determining the size of the entire pelvis, but the pictures are too distorted to permit a reconstruction of the actual shape and size of the pelvis. In spite of very ingenious contrivances, which of late have been suggested, the difficulties as yet have not been overcome. X-ray photography at the present day is still practically valueless for the purpose of pelvimetry.

But the word pelvimetry is misleading still in another respect. With the exception of two of the numerous methods of pelvimetry, we do not possess any means of ascertaining the length of any of the pelvic diameters with accuracy enough to justly permit the use of the term "measure" for this kind of rough estimation and calculation. Both in internal and external pelvimetry, when executed on the living, we measure the distance of ill-defined points, which are covered with a thinner or thicker layer of soft compressible tissue. This fact alone precludes exactness. A variation in the force with which the ends of any of the pelvimeters are brought in contact with the two points, marking the diameter, will of necessity lead to variations in the result. If the same diameter is measured repeatedly, either by the same or by various examiners, the

result will be a different one each time. In spite of the utmost care these differences will amount to several millimeters, and in the mensuration of external diameters even to one centimeter. They are unavoidable. But this fact is very seldom duly emphasized by writers. Many delight in giving in millimeters the length of pelvic diameters measured in the living, and some give them even accurate to the fractions of one millimeter. This is hypocrisy—to say the least—and such writers are largely responsible for the deplorable fact that pelvimetry is not as generally used by the general practitioner or the obstetrician as it should be. It must be an extremely discouraging experience of the beginner to encounter these inaccuracies in his mensurations, if he is not informed about them. We should not be surprised if he soon gives up the use of the pelvimeter.

This misapplication of the Greek word “metron” (measure) in the word pelvimetry becomes quite apparent by a comparison of what a term like external pelvimetry suggests, and what in reality it means.

When Baudeloque in 1775 devised his calipers and described his method of measuring the external conjugate, which in his honor is called the diameter of Baudeloque, he considered the problem of pelvimetry definitely solved. Smellie had invented his method of digital mensuration of the diagonal conjugate several years before, there were already instruments existing for the mensuration of this conjugate (*e.g.*, that of the elder Stein), but Baudeloque was convinced that his external pelvimetry was the more reliable and more useful method, and I am afraid a few of the modern text-book writers still share Baudeloque's opinion.

External pelvimetry is based upon the principle, first suggested by Baudeloque, that there exists a definite proportion between the length of the external and internal diameters of the pelvis, or in other words, that by means of certain subtractions from the length of an external diameter the length of the corresponding internal diameter can be determined. This principle is to-day recognized as absolutely erroneous. This constant proportion does not exist, not even for any one of the various diameters, certainly not between external and true conjugate.

The points commonly used in external pelvimetry are: the spinous process of the last lumbar vertebra, the anterior superior spines and the outer edges of the crests of the iliac bones,

and the heads of the trochanters, that is, points which do not stand in any immediate connection with the bones constituting the small pelvis. The variations in the thickness and shape of the sacrum, symphysis, femur, etc., in the thickness of the soft parts covering the points, from which the measurements are taken, are such as to practically exclude the possibility of determining in the individual case how much the deduction should be. In the light of most painstaking investigations it seems absurd to draw any positive conclusions regarding the size of the pelvis from these external diameters, but very many writers still do it. Although practically unfit for the determination of the *size* of the pelvis, external pelvimetry, as will be later shown, must be regarded a very valuable method in the recognition of an existing anomaly in the *shape* of the pelvis.

One more fact may be mentioned in support of my contention that the utility and accuracy of the various methods of pelvimetry in general is exaggerated. Every text-book of obstetrics contains the well-known picture which illustrates the digital mensuration of the diagonal conjugate: a median section through a pelvis with the hand of the examiner in the typical position, the thumb pressing against the outer surface of the symphysis, the tip of the middle finger resting against the promontory, the third and fourth finger folded into the palm. If you look at such a picture with the critical eye of the artist, you will easily recognize that this middle finger always is considerably out of proportion, quite hypertrophied and elongated. Of course, the artist who draws such an illustration and the student who is enlightened by it, do not know that it is impossible to reach the promontory with a normal sized hand in a normal-sized pelvis as long as there is a normal perineum present. Illustrators with artistic feeling, therefore, use for their illustrations a median section through a dried pelvis, and then place the fist of the examining hand somewhere into the pelvic cavity, where it never can be placed in the living woman. This hypertrophied middle finger is a rather typical feature of illustrations pertaining to pelvimetry and kindred subjects, because it is not generally understood that the diagonal conjugate can be measured only in contracted pelvises.

And what is the practical value of a knowledge of the length of the diagonal conjugate?

In order to obtain the length of the true conjugate in normally shaped pelvises a deduction of about 15 to 18 millimeters

must be made from the diagonal conjugate. In abnormally shaped pelves the necessary deduction varies between nothing and 30 millimeters, according to careful investigations made on cadavers. This fact implies a degree of inaccuracy which would make the mensuration of the diagonalis valueless, if we would not have some means of estimating in some manner the amount of the subtraction necessary in the individual case. The experienced examiner actually learns to estimate the height of the symphysis, its inclination and the relative position of the promontory to the plane of the pelvic inlet, and from these observations approximately determines the deduction to be made from the diagonal conjugate. But of course, since the exactness of the determination of the length of the true conjugate by this method is entirely dependent upon the versatility and the judgment of the examiner the value of the method in general practice becomes rather limited. It should be well borne in mind that the unavoidable inaccuracy of an estimation of the length of the true from the length of the diagonal conjugate may easily amount to one-half centimeter and more. If writers, as is the common practice, in this manner "measure," in reality roughly guess, this diameter, then speak *e.g.* of a true conjugate of 77 mm. and make learned deductions, whether such a diameter necessitates the one or the other obstetric operation, they clearly transgress the limits of propriety. In my opinion they would serve the cause of pelvimetry better by speaking more modestly about a true conjugate somewhere between seven and a-half and eight cm., remembering at the same time the fact that even that may be incorrect.

The danger of a positive reliance upon this method of determining the length of the true from that of the diagonal conjugate is convincingly shown by a case which is quoted in a recent article by Sellheim (*Hegar's Beitr.*, IX, p. 253). He found in the pathologic museum a generally equally contracted pelvis with a diagonal conjugate of 9 cm., in which the true conjugate also measured almost 9 cm. This pelvis belonged to a woman who had given birth spontaneously to a full-term child. If this diagonalis would have been measured before labor and the length of the true conjugate estimated by a deduction of only 2 cm., Cesarean section would have seemed the only possible means of delivering this woman of her child.

I shall next consider the accuracy of internal instrumental pelvimetry, but will first give a brief résumé of the various prin-

ciples underlying the different methods which are used at the present time.

Practically all instruments designed for the purpose of internal pelvimetry can be grouped according to three principles of pelvimetry.

The first principle, the oldest one, is that of direct mensuration. It has been invented by the older Stein and Coutouly. It comprises the pelvimeters with which the true conjugate is directly measured by bringing the end knobs of the two branches of the instrument simultaneously in contact with both the promontory and the symphysis. Such pelvimeters either resemble the shoemaker's sliding scale, or consist of a pair of bent levers, hinged together in the middle without being crossed, like the arms of a glove stretcher. A compression of the two ends on one side causes a corresponding separation of the other ends of the two arms. The latest of the numberless variations and modification of the well-known "Pelvimeter of the older Stein," has been recently described by Solowij (*Zentralbl. f. Gyn.*, June, 1905). The principle of the sliding scale, first invented by Coutouly, in 1810, is employed in Farabeuf's pelvimeter (invented in 1889), which is described and recommended in some of the modern American text-books of obstetrics. The instrument recently described by Bylitzki (*Monatsch. f. Geb. u. Gyn.*, XX, 1904) belongs to this same group.

The one chief shortcoming of all instruments which attempt the direct mensuration of the true conjugate lies in the fact that during mensuration the instrument at the same time touches both the promontory and the symphysis. The stretching of the vagina necessary for this purpose, implies numerous disadvantages, among them the following: The procedure is extremely painful; the vagina may be injured and occasionally the end of the arm, destined to reach the promontory, has perforated the vagina; if the vagina is rigid, that is, in most primigravidæ, the measurement obtained in this manner, in all probability will be too short. Obviously many efforts have been made to eliminate the faults of this method. The ends of the promontorial branch of the instrument have been made broad and blunt, spoon-shaped, or have been armed with large buttons. But such modifications lessen the precision of the instrument. In order to overcome the difficulty and necessity of stretching the vaginal wall, instruments have been constructed in which the posterior promontory branch

is introduced through the rectum, and others in which the anterior branch is slipped through the urethra. A new instrument of this latter type has been published by Gigli, in 1902. It can be easily understood why these modified instruments have not been adopted for general use.

The second group comprises the instruments which measure the true conjugate indirectly, by means of a principle, which is known as that of into-external pelvimetry. By palpation a point is determined on the mons veneris in front of the pubic symphysis, which represents a direct continuation of the true conjugate to the skin covering the symphysis. This point is marked and measurements taken from it to the promontory, and to the inner surface of the symphysis respectively. This last measurement indicates the thickness of the symphysis. A subtraction of this dimension from the distance between marked point and promontory gives the length of the conjugata vera.

To Wellenbergh (1831) belongs the credit of having constructed the first practicable instrument based upon this principle of indirect mensuration. The Wellenbergh instrument was first successfully improved by Van Huevel, and later (1887) by Skutsch. The latter's instrument is at the present day probably more generally used than any other, although most American authorities favor the pelvimeter of Hirst, which is also based upon the Wellenbergh-Van Huevel principle.

The exactness of the results obtained with the various methods of into-external pelvimetry, is to a very large extent dependent upon the versatility of the examiner and his familiarity with the use of the particular instrument. It is a decidedly difficult task, even with the help of an assistant, to keep one branch in contact with the middle of the promontory and to bring at the same time the end of the other branch near the point marked on the skin in such a way, that it just touches the surface and does not press down the skin. If, at the two mensurations, necessary for determining an internal diameter, the end knobs press against the compressible skin with a different force, the result of the measurement of necessity will be faulty. The principle of this form of into-external pelvimetry is not mathematically correct. In practice it is impossible to determine exactly where a direct continuation of the internal diameter, which shall be measured, strikes the skin, and the precision of the mensuration is dependent just upon this point.

It cannot be denied, however, that in spite of the difficulties and inaccuracies of the method, an *experienced* examiner may succeed in determining the true conjugate within a few millimeters of its actual length.

A third and entirely new principle has been introduced into instrumental internal pelvimetry by an instrument devised by me in cooperation with Dr. Jul. Neumann of Vienna. (A detailed description of this method can be found in *AM. JOUR. OF OBST.*, May, 1903.) The principle underlying the Neumann-Ehrenfest pelvigraph is that of geometric projection. By means of this instrument a drawing can be obtained, which pictures exactly the median sagittal section through the pelvic canal in its natural size. Like the methods of into-external pelvimetry, pelvigraphy is too complicated for general use, requires trained assistance and special versatility on the part of the examiner. The Neumann-Ehrenfest pelvigraph has, however, two decided advantages over those methods of pelvimetry which are based upon the Wellenbergh principle. The pelvigraph is mathematically correct, and by producing an exact diagram of a median section through the entire pelvic canal it defines not only the size, but also the shape of the pelvis at least in this one plane. Mention may be made of the fact that the Neumann-Ehrenfest instrument, like the Skutch instrument, at least theoretically, can be used for a determination of the transverse diameter of the pelvic inlet. But very little reliance can be placed upon the result of this mensuration.

Finally I may be permitted to advance a few arguments in favor of my contention, that in general exaggerated claims are made for the practical value of pelvimetry, or more correctly, for the knowledge of the length of the true conjugate.

J. C. Arantius, a disciple of Vesalius, recognized at about the middle of the sixteenth century the narrow pelvis as one of the most important causes of a delay and at times of an absolute impossibility of the expulsion of the fetus *per vias naturales*. The significance of the narrow pelvis in the etiology of dystocia is to-day generally admitted. The early recognition of an existing disproportion between the size of the fetal head and the size of the pelvis has become one of the most important tasks of the modern obstetrician. It is obvious that such a disproportion can be definitely ascertained only by determining the exact dimensions of both the fetal head and the pelvis. We do not possess, however, a reliable or even practicable method

of cephalometry. But even if we would have such a method we would not be any nearer the solution of the problem. If it were not for the fact that the fetal head is compressible and moulds in the course of labor, no fetal head could pass even through a normal-sized pelvis. The moulding of the head is dependent upon the strength and the character of labor pains and upon certain anatomic conditions of the fetal skull, that is, upon factors which can be neither measured nor estimated. It is obvious that labor may progress normally if in a case of contracted pelvis the pregnancy ends prematurely. On the other hand, a perfectly normal pelvis may prove too small in the presence of an abnormally large head or one which is not compressible or does not mould on account of a deficient action of the uterus. If we to-day base the assumption or diagnosis of an existing disproportion between fetal head and pelvis on the ascertained shortness of the true conjugate, we leave out of consideration the size and compressibility of the fetal head, or take it for granted, that they are normal. This practice has become general—of necessity—but has thus led to an unwarranted belief in the importance and practical value of pelvimetry.

It is an interesting and most noteworthy fact that in the teachings of the modern obstetrician concerning the prognosis and therapy of labor in cases of contracted pelvis, practically everything is made dependent upon the length of the true conjugate. This diameter decides the choice between such operations as high forceps, symphyseotomy, hebotomy and Cesarean section. Most practitioners (and I do not mean to exclude by this term the obstetricians) have formed the opinion that the true conjugate actually is the one diameter which in cases of contracted pelvis decides the outcome of labor. This opinion obviously is erroneous. We have learned to be satisfied with a knowledge of the length of this one diameter, simply because no known method of pelvimetry enables us to measure with reliable or sufficient accuracy any other dimension of the pelvic inlet.

In my opinion just this mistaken and unjustified reverence accorded to the true conjugate has led to the inexcusable neglect of the mensuration of the pelvic outlet, the only other plane of the pelvic canal which we really can measure. I have already stated that the anteroposterior and the transverse diameter of the pelvic outlet can be determined with a reason-

able degree of exactness, especially in patients who are not very stout. The methods employed for this purpose are comparatively simple and the practical importance of a knowledge of these diameters is generally conceded. Authorities, who of late have adopted the measurement of these diameters as a routine practice, contend that contractions of this portion of otherwise apparently normal pelvis are decidedly more common than is generally thought. They often account for an unexpected difficulty in the final expulsion of the fetal head which has fully entered the pelvic cavity. Text-book writers should lay more emphasis on the fact that the contraction of a pelvis is not limited to the inlet, and that the recognition of the character and degree of a pelvic deformity is not alone based upon the result of the mensuration of the true conjugate, that is, upon a procedure which the non-specialist is not expected to master. Then probably the practitioner will more often resort to a mensuration of the pelvic outlet.

Of course, as long as we cannot measure the size and the compressibility of the fetal head, the practical value of pelvimetry, or as we may say more appropriately, the practical value of a knowledge of the length of the true conjugate and the size of the pelvic outlet will remain limited. But after all, it is not alone the actual disproportion between head and pelvis which in cases of pelvic deformities leads to anomalies in the course of labor.

A little more than fifty years ago Michaelis from very careful observations concluded that *anomalies in the shape of the pelvis* favor faulty presentations and abnormal mechanism of labor. To-day the fact is generally admitted that an abnormal configuration, especially of the pelvic inlet very often is responsible for such conditions as face or brow presentation, transverse position, a premature rupture of the membranes or a prolapse of the umbilical cord. It is obvious that in the etiology of such pathological conditions only the abnormal shape and not the actual contraction plays the important rôle. From the point of view of practical significance the claim, therefore, seems justified that a physician first of all should be able to recognize the mere presence of a pelvic deformity. But this fact is in general not duly appreciated. We read and hear so much about pelvimetry; comparatively little, however, about the methods which enable us to diagnose the existence and the special character and type of an abnormal configuration of the pelvic canal.

I shall devote this last part of the paper to a brief consideration of such methods, and thus find opportunity to explain what in my opinion the true practical value of external and internal pelvimetry is.

(a) CLINICAL HISTORY.

The overwhelming majority of all pelvic deformities develop as the result of rachitis, osteomalacia and chronic affections of the hipjoints. A systematic and careful inquiry into the history of the patient will reveal the existence of any one of these conditions.

The history of preceding labors is of still greater importance in multigravidæ. Several births of full-term children may be accepted as almost conclusive proof that the pelvis is of normal size. No better method of pelvimetry than a normal labor at the normal end of pregnancy. In patients in whom previous confinements were pathological and had to be terminated by the use of instruments, a careful study of the particular features of labor may permit, if not a diagnosis, at least a conjecture concerning the nature of the pelvic abnormality.

(b) INSPECTION.

Although not practicable in every pregnant woman an inspection of the stripped patient in standing position should be sought for in every instance in which a pelvic deformity is suspected. The ability of recognizing by inspection anomalies in the pelvic inclination, in the configuration, position and inclination of the sacrum, asymmetries, deformities of the vertebral column, etc., is easily acquired. Such observations in conjunction with characteristic anomalies in the stature and especially in the gait of the patient often permit a positive diagnosis, not only of the existence but even of the special type of a pelvic deformity.

(c) EXTERNAL PALPATION.

The value of palpation is obvious. Rachitis, osteomalacia, and spondylolisthesis cause marked and characteristic changes in the outlines of the pelvic bones.

(d) MANUAL EXPLORATION OF THE PELVIC CAVITY.

Smellie in the middle of the eighteenth century first described and duly emphasized the advantages of a digital exploration

of the pelvic cavity. To-day this procedure is generally accepted as the most serviceable and reliable aid in the recognition of both the character and the degree of a pelvic contraction. The careful examination of the pelvic cavity must be a part of the routine examination of every pregnant woman. The technique of this procedure is of paramount importance for its success. The pelvis must be explored in a systematic way. First the height and inclination of the symphysis are examined, then the pubic angle, next the sacrum, its lateral and vertical curvature, the sacrococcygeal joint, the position and shape of the promontory, the curve of the innominate lines and so on, winding up with a digital mensuration of the diagonal conjugate, if that is possible. With such a routine exploration of all pelves noteworthy deviations from the normal shape are detected with comparative ease.

(e) EXTERNAL PELVIMETRY.

I had occasion in a preceding part of my paper to state that external pelvimetry does not permit any conclusions concerning the size of the pelvis, furnishes, however, a very important aid in the detection of an existing deformity. Fully satisfied that the determination of the intertrochanteric diameter is void of any practical value, and that practically no deduction can be drawn from the length of the external conjugate, I personally limit myself to a routine mensuration of the distance between the anterior superior spines and the outer edges of the iliac crests respectively.

In normally sized pelves the interspinous diameter measures between 24 and 27 cm., the intercrystal between 27 and 30 cm. Such figures do not by any means indicate a normal length of the transverse diameter of the pelvic inlet. Nevertheless the mensuration of these two external diameters must be regarded as one of the most useful means at our disposal in the diagnosis of a pelvic deformity. It has been found that in almost all normally shaped pelves the intercrystal diameter is about 3 cm. longer than the interspinous. On the other hand, in rachitic pelves this difference in length is so constantly reduced, that the probable diagnosis of a rachitic deformity of the pelvis can be made whenever the intercrystal diameter is found but 1 cm. longer than the interspinous, or equals its length or possibly is even shorter. The inference, however, cannot be drawn that every pelvis which presents the normal difference of 3 cm. is

normal in shape, because in rare instances even in rachitic pelvises this difference of 3 cm. is met with.

In a *generally equally contracted* pelvis the normal shape of the pelvis is preserved. Such a pelvis, therefore, will show the normal difference of 3 cm. between the two diameters with a distinct reduction in the length of both, *e. g.* D. Sp. 20 cm., D. Cr. 23 cm.

The external mensuration of a *generally contracted rachitic* pelvis, on the other hand, will demonstrate an absolute reduction in the length of the two diameters with a simultaneous reduction in the difference of their respective length, *e.g.* D. Sp. 20 cm., D. Cr. 21 cm., while in the *simple flat rachitic* pelvis the diameters probably would be 25 and 26 cm.

A middle position between external and internal pelvimetry is held by the methods employed for a determination of the size of the pelvic outlet. It would seem advisable to take these measurements in every case.

(f) INTERNAL PELVIMETRY.

At the time of the first internal examination of the patient an attempt should be made to measure the diagonal conjugate with the examining finger. Whenever we are able to reach the promontory in the presence of a normal rigid perineum, we are justified in assuming that the pelvis is contracted in its antero-posterior diameters. If the contraction is marked, if difficulties during labor may be expected and the pelvis is symmetrical, an effort should be made to ascertain the length of the true conjugate in a reliable manner, that is, by means of internal instrumental pelvimetry. For this purpose the Skutsch, the Hirst or the Neumann-Ehrenfest instrument can be used. Every examiner has special likings in this respect, and usually is familiar with the use of but one of the instruments. In patients with a relaxed vagina also Farabeuf's or Bylitzki's pelvimeter may prove useful. Asymmetrical pelvises cannot be measured at all, a fact not generally recognized. It may be well to bear in mind, however, that all these methods yield reliable results only in the hands of the expert. A knowledge of the special type of pelvic deformity, and of the approximate length of the true conjugate, together with a careful consideration of other factors, such as approximate size of the fetal head, the history of preceding labors, etc., will in the individual case help to decide upon the appropriate mode of therapeutic interference. The

scope of this paper does not permit, however, to enter here into a discussion of the practical application of the results of pelvimetry.

My adversely critical attitude toward the manner in which pelvimetry is taught and exploited at the present day must not convey the wrong impression that I deny or even do not fully appreciate the value of pelvimetry. I am well aware of the fact that we owe to pelvimetry our present advanced knowledge of the abnormal pelvis, of the various forms of dystocia caused by it and their therapy. I recognize the advantage and regret the neglect of pelvimetry in every-day practice. I believe, however, that this useful method of examination would find a wider application both at the hands of the general practitioner and the specialist obstetrician, if the actual value of mensuration of certain pelvic diameters would be more appropriately appreciated and if writers would be more careful not to create erroneous and exaggerated ideas concerning the utility and accuracy of the various methods of pelvimetry.

OLIVE AND VANDEVENTER AVENUES.

EMBOLISM FOLLOWING ABDOMINAL SECTION.

BY

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THAT form of metastasia in which insoluble substances are transported by the blood current and lodged in some part of the vascular system is known as embolism. The material transported is an embolus. The process may occur in lymph vessels as well as in blood vessels; although the latter, hematogenous embolism, is the more important form. Emboli may be gaseous, liquid or solid. The most common emboli are those composed of the products of coagulation of the blood and are usually derived from a thrombus.

Embolism which occurs in the direction of the normal blood current is of the most frequent occurrence. Retrograde emboli are more likely to occur in the lymph stream than in the blood and play a very important part in the lymphogenous metastasis of tumors.

*Read before the Philadelphia Obstetrical Society, November 2, 1905.

Emboli may be bland or infective. In the former case the thrombotic material does not contain toxic or infective agents and its effects are purely mechanical. The infective emboli contain pathogenetic microorganisms and there is added to the mechanical effect produced by these shown at the point of lodgment, the characteristic effect of the bacteria which they contain.

Fat embolism is more apt to occur in general surgery than in gynecologic work as the source of the fat is usually the bone marrow. Air embolism is generally produced by wounds or surgical operations about the neck and upper extremities.

The general symptoms of non-infective embolism depend upon the anatomical position and relations of the occluded vessel, the specific functions of the part supplied by it, and the degree of anemia produced by the obstruction.

According to Welch the order of frequency of arterial embolism is as follows: pulmonary, renal, splenic, cerebral, iliac and arteries of the lower extremities, celiac axis with hepatic and gastric branches, central artery of the retina, superior mesenteric, inferior mesenteric, abdominal aorta, and coronary arteries.

The subject selected is simply emboli following celiotomy. In a review by Dearborn (*Annals of Gynecology and Pediatrics*, Nov., 1904) of the work of twenty-five surgeons of Boston and vicinity it is shown that thrombosis and embolism are more common after operations in the pelvis than after operations in any other part of the body. Further, that it is possible that many cases of pleurisy, pneumonia and pulmonary abscess following operation are due to emboli. Large emboli almost always cause speedy death by syncope or asphyxia; very small emboli usually run a favorable course. Dearborn says that any sudden increase in pulse rate during convalescence, the temperature remaining about normal, should remind one of the possibilities of thrombosis, and that if there are evidences of phlebitis or of thrombosis, absolute rest in bed must be insisted on. Agnew observes that "after operations in which much blood has been lost, there is always more or less tendency to the formation of coagula. This may take place in the vessels of the extremities, and by forming an obstruction to the circulation, cause the limb to fall into a state of gangrene. From the same tendency to coagulation of blood a clot may form in the heart sufficiently large to destroy life. He has seen both these

accidents occur. Hence he says it is of the first importance that patients thus predisposed should be kept perfectly quiet and in the recumbent posture. Any considerable effort, such as sitting up in bed, when the power of the heart has been lessened and the vessels deprived of a large amount of blood by an operation, exposes the individual either to a fatal syncope, or to the formation of obstructive plugs of fibrin."

Literature on the subject of post-operative thrombosis and embolism is scanty and in all probability the fatal cases on record do not represent the full number of deaths from this cause. An interesting fact in almost all the cases recorded in full is that these cases of embolism have occurred almost uniformly when the patient was doing well, often when cure was considered complete.

Thrombosis may result: (1) After a prolonged or severe operation. (2) As the result of sepsis in the wound. (3) Where neither of the above conditions obtain. If thrombus due to stagnation of blood occurs, it occurs during the formation of the clot, most commonly about a week or ten days after the operation; though it may take place very much earlier than this, and it may occur as late as the third week.

In a résumé of 7,130 gynecological operations Schenck reports forty-eight cases of thrombosis. He points out that this complication is much more common after operations in the pelvis than after operations in any other part of the body.

Injury to the large venous trunks by too forcible use of retractors is a possible cause in some cases. Ligation of a vein close to the point at which it enters the main venous trunk may cause thrombosis in that trunk by extension of the clot. Anemia and cachexia accompanying malignant disease has been found to be a factor.

Among the processes which lead to pulmonary embolism, according to the frequency of their occurrence, the formation of thrombi within the venous system must be named in the first place; and the head of the list is thrombosis of the veins of the leg, as in protracted fever and in fractures. Next in order of frequency are those emboli which originate in thrombosis of a vein after pelvic and abdominal operations and after parturition.

The consequences of an embolism depend very much on the nature of the embolus, the area of the blood vessels occluded and the function of the organ disturbed. The branches of the

pulmonary artery in the lower lobe of the right lung are most frequently affected due to the power of the blood current and weight of the embolus according to Eichorst.

Death is sudden and often without warning, and it is not known how the heart ceases. The sudden non-appearance of blood in the vessels of one lung is very important. In other cases death is not caused by syncope but by asphyxia; such an attack always sets in suddenly. The patient has a violent sensation of suffocation, as though his throat were constricted, the face which at first is pale, speedily becomes cyanotic, the eyes may protrude and pupils dilate, the jugular veins swell, the respiration is accelerated, the heart action becomes tumultuous and irregular. At the same time the patient complains of a continuous, severe, painful feeling of oppression; the want of breath is very great, but cannot be satisfied because, although air enters the alveoli, the demand for oxygen cannot be relieved; for the required blood supply is wanting; the skin is cold and clammy. Death may follow in an hour or two. In other cases the fatal issue does not occur for a day or two. The first oppression subsides and the patient rests more easily; but soon a fresh attack of dyspnea and oppression sets in, which may be repeated several times with remissions until in one of these attacks life is extinguished. Pulmonary embolism may not cause immediate death but produce infarction accompanied by pleurisy and a temperature of 101-102. There may be an area of consolidation. Recovery depends upon the size of the embolus, the condition of the lungs and the presence of bacteria in the embolus.

Dr. J. C. Warren reports two cases, one following hysterectomy and the other operation for cancer of the breast. Both were fatal.

Dr. M. H. Richardson reports ten or twelve cases, the probable source of embolism being the exterior and interior iliac veins. Mortality 100 per cent. Death was instantaneous, with no time for treatment. All were cases after abdominal operations as hysterectomy, ovarian tumor, hernia, etc.

Dr. H. H. A. Beach writes: "I have seen it sufficiently often to make me very guarded in the prognosis of any abdominal operation. I am always on the watch for it in cases of high leucocytosis. One is most apt to see it in the cases in which he is especially anxious for patients to make a good recovery. As nearly as I can remember I have seen more cases after appendix operations than from any other source."

Dr. J. C. Munro thinks autopsy necessary to diagnosis of embolism. He reports two cases, both of which recovered. One was appendectomy, the other cholecystotomy.

D. E. W. Cushing reports three cases. One was vaginal hysterectomy with embolism in the third week and recovery of the patient. Second was also a case of vaginal hysterectomy with embolism in the third week and sudden death. Third, abdominal hysterectomy and death on the second day from embolism.

Dr. J. C. Irish has had six cases, all fatal.

Dr. Malcolm Storer reports two cases, both hysterectomies, with 50 per cent. mortality.

During twelve years of rather active gynecologic work I have had an opportunity of observing five cases of embolism, four of which resulted fatally.

CASE I.—Miss B., school teacher. The operation was dilatation and curettement of the uterus with resection of the right ovary. Six hours after the operation the patient suddenly expired with the characteristic symptoms of pulmonary embolism. The abdominal wound was reopened and a small broad ligament clot was found on the right side. No further autopsy was permitted. The notes in this are rather incomplete.

CASE II.—Mrs. J. G., aged 41 years, was operated upon for a four-pound fibroid uterus, on October 6, 1904. The patient was extremely anemic before operation and several weeks were spent in improving the blood condition. She bore the operation well and her condition was absolutely normal until the morning of the fifth day when while eating her breakfast she suddenly became blue, complained of severe pain and expired before the resident physician could reach her room from another part of the hospital.

CASE III.—Mrs. L. W., a German, aged 43 years, had been suffering for three years with irregular and painful menstruation with severe pain in both inguinal regions. She was operated upon for double pyosalpinx, November 2, 1904. Both tubes were firmly adherent and filled with pus. Double salpingo-oophorectomy was performed and the pelvic cavity drained with iodoform gauze through the vagina. The patient was very ill for three days after the operation, but she gradually improved, and was able to sit up in bed. On the thirteenth day, while eating her dinner, she expired with symptoms of pulmonary embolism.

CASE IV.—Miss D., aged 44 years, admitted to Samaritan

Hospital September 21, 1905, and operated on September 30, 1905 for a fibroid uterus the size of a cocoanut. The patient was extremely anemic on admission, and rest in bed and forced feeding were employed for two weeks prior to operation and the vagina was kept tamponed with renewed packings of iodoform gauze to prevent further hemorrhage. The blood count was markedly improved by the time of operation. Supravaginal hysterectomy was performed and the uterus found to contain a large degenerating submucous fibroid. The patient made an uninterrupted recovery until two weeks after the operation when, after sitting up out of bed for a short time, she developed symptoms of embolism and expired in a few minutes in spite of energetic stimulation.

CASE V.—Mrs. M. S., aged 37 years, was operated upon April 12, 1904, for uterine prolapsus of the third degree. The uterus was dilated and curetted, the cervix repaired; anterior colporrhaphy, perineorrhaphy and ventral suspension performed. The patient had an absolutely normal convalescence and sat up on the twenty-first day after operation. On the twenty-second day while sitting in a chair by her bedside she was taken with a fainting attack, and became unconscious for a few moments. She recovered consciousness with an extremely weak pulse and a severe pain beneath the sternum. Her face was cyanotic; respiration between 40 and 50; pulse 168; temperature 95. Atropine, strychnia, digitalin were administered hypodermically; external heat was applied and oxygen given. The patient was in an extremely critical condition for two days, the pulse varying from 130 to 150; but she gradually improved, made a good recovery and left the hospital in good condition thirty-nine days after admission.

The symptoms in all these cases as nearly as could be observed were very similar. The attack was characterized by precordial distress, severe pain and dyspnea associated with quickened pulse. The patient has an extremely anxious expression, gasps for breath with the aid of all the auxiliary respiratory muscles, the face becomes cyanosed, cold, clammy sweat occurs, the mind remains clear as a rule, and death occurs in a few minutes in spite of energetic stimulation. The fifth case reported manifested all these symptoms and yet recovered.

Mahler, aside from the clinical symptoms, lays great stress upon a persistent frequency of the pulse rate which is out of all proportion to the elevation of temperature.

Kelly says "the fact that these cases occur teaches anew the important lesson that the surgeon is never warranted in guaranteeing the recovery of the patient even after a seemingly simple operation. Patients whose vitality is depressed and those who are anemic should be watched with especial solicitude."

When these accidents occur the surgeon feels powerless because there is practically no treatment for the severe cases. It is probably possible by a careful study of the blood before operation and the avoidance of excessive loss of blood during the procedure and the use of saline infusions after the procedure to diminish the number of these cases. In anemic cases a longer rest in the absolutely recumbent position with the avoidance of all exertion or straining for a longer period than is customary is also to be advised. This latter seems to be the lesson which I have learned from these sad experiences.

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SOME OPERATIVE AIDS IN ABDOMINAL WORK*

BY

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THE major technique of most abdominal operations is now so well settled that the work of one operator does not differ materially in this respect from that of his colleagues. It is to the little matters of detail, therefore, that one must direct his attention in trying to find out why the work of one man is smoother and more successful than that of another. It is not sufficient that our patients recover, but the conscientious operator will not be satisfied unless they recover with the least possible amount of pain and discomfort, in the shortest possible time, and with no after-effects attributable to the operation. Each of us, no doubt, has some pet maneuver or matter of detail which may not seem important to others, but which he considers to be rather essential to good work. We all want to improve our technique, and I have thought that a paper which would serve as a basis for a discussion of operative detail might bring out points which would be of advantage to all of us.

*Read before the Washington Obstetrical and Gynecological Society, December 1, 1905.

For purposes of convenience I have divided the subject into consideration of what may be done to aid us in our work before, during, and after operation.

A great help to a good operator is to have sufficient time to thoroughly learn the physical condition of the patient. Of course, there are many cases in which immediate operation is necessary. An acute appendicitis, a ruptured tubal pregnancy, or an obstruction of the bowels will not permit of delay. In these cases the patient must take her chances as the imminent danger to life overshadows all other considerations. In a large class of cases, however, time is not so important an element, and I believe that, in such cases, the patient's best interests will be conserved by keeping her in the hospital long enough to allow us to ascertain her exact physical condition. A woman, for instance, who has carried a uterine fibroid for many years can well carry it a week or ten days longer, while we are investigating the condition of her heart, arteries and kidneys. I fear that we often lose sight of the fact that it is the patient upon whom we are to operate and not the disease. A thorough examination of the blood, the urine, and all the thoracic and abdominal viscera is of mutual advantage to patient and surgeon. From an operative standpoint the degree of anemia and the hemoglobin percentage are the most important elements in the routine examination of the blood. The hemoglobin percentage may be estimated with sufficient accuracy by the Tallquist scale. A percentage of fifty should be regarded with anxiety, and von Bergmann considered that when the hemoglobin is reduced to thirty-five per cent. operation is unjustifiable. A low percentage can be materially increased in most instances by attention to rest and diet, and by the use of appropriate remedies. I understand that our late president, Dr. Boveé, claims some remarkable results from the use of enemata of salt solution in this class of cases. Preliminary treatment in these cases may mean the recovery of a patient from an operation that would have proved fatal without this judicious delay.

The second blood-condition which is of interest to the surgeon is anemia. We must recognize the fact that in many cases the anemia is due to the condition for which operation is contemplated, and that the condition of the blood cannot be materially improved until the source of the anemia is removed. In other cases it is time well spent to try to correct this complica-

tion by appropriate measures. Briefly we may say that while one may have to perform an operation of necessity in the presence of a grave anemia, no one would care to perform an operation of election handicapped by this disturbing factor.

An examination of the urine does not mean the mere determination of the specific gravity and a perfunctory testing for albumen and sugar. It means, or should mean, the examination of a twenty-four hour specimen and an estimation of the total amount of solids, and of the urea excreted. There is a rapidly accumulating body of literature on fatal acetonemia following the use of anesthetics, particularly chloroform, and it seems to me that in the future we shall have to add to our routine examination of the urine a search for acetone and diacetic acid. The total amount of solids excreted in twenty-four hours is a very important factor in estimating a patient's chances of recovery from operation. Many deaths which are put down to shock, etc., might be explained by a neglect of this precaution. The careful examination of the urine will often lead to the postponement of a contemplated operation until a more favorable condition of things can be brought about.

With respect to the thoracic viscera, I think that the most important consideration is the condition of the heart muscle. I do not feel that a well-compensated valvular lesion is any bar to the administration of an anesthetic. I am sure that we have all seen cases of this character where the patients went through the anesthesia with perfect comfort and freedom from danger. When, however, there are evidences of myocardial changes or arteriosclerosis, I believe that the administration of an anesthetic is accompanied by grave danger, and the question of operation in these cases is one which should be decided only after considerable thought and a careful weighing of all the factors in the case. I cannot speak from experience of the value of blood-pressure observations in operative cases, but should be inclined to consider them, theoretically, of some value, especially in doubtful cases.

Any acute or extensive disease of the respiratory apparatus, of course, would lead to the postponement or abandonment of a contemplated operation.

Increasing experience has taught me the value of the routine examination of *all* the abdominal viscera, where operation is contemplated. Where we find disease of a single abdominal organ, particularly where the history and symptoms point to that organ

as the seat of the trouble, I think that we are inclined to give the rest of the contents of the abdomen a rather cursory examination. I frankly confess my own past remissness in this particular, and I have been startled on several occasions, upon opening the abdomen, for apparently manifest disease of one organ, to find extensive and unsuspected disease in other organs and structures. We cannot make too minute or too conscientious examination of all the abdominal structures, particularly the liver.

I am inclined to agree with Stone in his opinions as to catharsis. I find that I get just as good operative results when the patient has three bowel movements during the twenty-four hours before operation as when she has a dozen or more. It seems to me to be an irrational procedure to drain the fluids out of a patient by hypercatharsis, and then to use salt solution for the purpose of replacing them. In my judgment we need just enough catharsis to secure reasonably empty intestines at the time of operation and no more. In my work this is secured by one or two bowel movements the day before operation, and a high enema on the morning of operation, or rather, just before operation. Hypercatharsis seems to me to be a relic of the days when the dread of peritonitis was the great bugbear in abdominal surgery. I believe that the excessive use of cathartics exhausts the intestines and predisposes to intestinal paresis.

I hesitate to mention the subject of hand sterilization. There are so many methods, and each operator seems to be so wedded to his own particular one, that it is useless to try to argue for the superiority of any one method over another. There is one element common to them all, however, and that is the thorough preliminary use of soap and water, and, for my own part, if I had to dispense with soap and water, or the chemical germicides, it would be the germicides that would go. Personally I use gloves, and do so upon the simple proposition that it is impossible by any known method to render the hands free from pyogenic organisms, while the sterilization of gloves is a comparatively simple matter. I cannot see that their use in any way interferes with manual dexterity, and it is a source of satisfaction to realize that by their use we are thoroughly protecting our patients from the danger of infection from our hands.

I have come to learn that in the preparation of the hands of the operator, and the skin of the patient, it is not necessary to use the

vigorous scrubbing with a stiff brush which formerly was deemed essential. The use of stiff brushes is, in fact, detrimental, as it tends to produce minute abrasions in the skin which open the way for infection. Stiff brushes may very well be replaced by very soft bristle brushes, rubber brushes, or, in the case of very delicate skins, by gauze alone. In emergency operations, and in the case of patients with not too cleanly skins, I have found the use of Harrington's solution to be very effective. This is a solution recommended by Harrington of Harvard, as the result of his experiments in skin sterilization. It is composed of bichloride of mercury, alcohol and hydrochloric acid. It has the drawback of being somewhat irritating to delicate skins. As an instance of its effectiveness I may cite the following case.

In December, 1904, while operating on another patient at the Freedman's Hospital, a young colored man, twenty-six years of age, walked into the hospital, asking relief from a strangulated hernia. He gave a history of congenital hernia which had been in the scrotum for many years without giving him any particular trouble. He was an employee of one of the beef companies, and five or six hours before entering the hospital he had lifted a side of beef. Immediately afterward he had a severe pain in the hernia and vomiting soon followed. The pain and vomiting had grown steadily worse. Examination showed the right side of the scrotum to be tensely distended by a hernia as large as a man's head, and which was evidently strangulated. He was at once prepared for operation, the skin being disinfected by Harrington's solution. Owing to the extensive adhesion of the intestines to the sac, the incision had to be carried the full length of the scrotum, which is notoriously one of the most difficult regions of the body to sterilize. The fourteen-inch incision healed throughout by first intention.

Assuming that the patient has been brought to the operating table in the best possible condition, what can we do during the operation to ensure a favorable result?

In common with most American operators I prefer the operating room to be warm when the abdomen is to be opened. It seems irrational to believe that the intestines and the other delicate abdominal viscera can come to no harm from their exposure to a temperature twenty or thirty degrees lower than that to which they have been accustomed. A warm operating room lessens shock and increases the patient's chances of recovery. The

latest German work on surgery, in speaking of the preparations for abdominal section, states that the operating room should be warmed to about 20° or 24° C. (68° to 76° F.) German abdomens may be more tolerant of cold than others, but I am sure that most American operators prefer a higher temperature in their operating rooms. As the author devotes the following sentences of the paragraph to directing how the patient may be wrapped in cotton in certain cases, and how the intestines may be kept covered by hot towels, it is fair to presume that if the room were warmer there would not be so much need for extraneous heat.

Other things being equal, the operative work which is quickest done is best done. Given two operators of otherwise equal merit, the one who takes two hours to do what the other does in one, will, in the long run, have the larger mortality. This does not mean that anything is to be overlooked or done hurriedly, but it is surely a matter of common observation that one operator can do a given operation in half the time that it takes another, and it needs no argument to show which is the better operator. To take four hours for a breast operation, and in the course of it to use fifteen dozen hemostats seems to me to be carrying carefulness to the point of absurdity. Elements in rapid operating are a thorough preliminary conception of just what is to be done, based on careful examination, repeated if necessary; a well-trained assistant and increasing experience. A man does his one-hundredth hysterectomy in half the time that it took him to do his first one, and does it better. He is sure of himself and goes certainly and directly to the end he has in view. The satisfaction of having the same trustworthy assistant, day in and day out, is immense. He can anticipate our wants and save fret and worry in many directions. It is one of the disadvantages of work in the free wards of a hospital that no sooner do we get an assistant so trained that he is of some use to us than his term of service expires and we must wrestle with his successor, be he good, bad or indifferent.

The question of anesthetics is a subject in itself. The only reference to it that I shall make is to lay down the proposition, which I suppose no one will dispute, that the less the amount of the anesthetic given, the better. A well-trained anesthetist tends to good operating by enabling the operator to give his entire attention to the operation itself and not to divide it between the

operation and the anesthetist. I have alluded to the increasing literature on acetoemia and yellow atrophy of the liver, following prolonged or excessive narcosis by chloroform. It is evident that we can no longer assume that our patients have recovered from all danger from the anesthetic merely because they have regained consciousness. The remote effects of anesthesia demand careful study.

The ligature question has been settled for me by the use only of absorbable ligature and sutures within the abdominal cavity, except for intestinal work. I have never seen any bad results attributable to them, and their advantages over non-absorbable material seem to me to be obvious. In intestinal work I fancy that I can make a tighter and better suture with silk than with catgut. I have had no experience with the electric angiotribe. On the face of it the method is the ideal one and it is a desideratum to be able to dispense with all ligatures and sutures, but the truth is that, as yet, I have never been able to muster up courage enough to try it on a first case.

A word as to drainage. There are some cases which clearly demand drainage, and others which just as clearly do not. In the doubtful cases I do not drain and I cannot recall any one of this class of cases in which I thought that drainage would have changed the result. I am partial, particularly in suppurative appendicitis cases, to drainage through a separate opening, with closure of the original operative wound. The vagina and flank offer favorable sites for this form of drainage and the abdominal wall is not weakened.

For the past year I have followed, to some extent, Craig's plan of using eserine in my abdominal work in those cases where the intestines were not interfered with or damaged. Briefly stated, Craig advocates the hypodermic injection of eserine salicylate, in doses of from 1-30 to 1-60 of a grain in every case of abdominal section where it is evident that the intestine will not be injured. The effect of this is to stimulate intestinal peristalsis and to prevent post-operative ileus. The injection is given as soon as the abdomen is opened and the field of operation inspected. Craig precedes it by the hypodermic injection of atropia just before anesthesia. J. C. DaCosta claims that the procedure lessens post-operative nausea and vomiting, but I cannot say that it has had this effect in my hands. The following case illustrates the favorable results which may follow the use of eserine.

On February 24, 1905, I saw in consultation with Dr. Foye a young girl suffering from acute appendicitis. Immediate operation was necessary, and she was put on the operating table soon after her arrival at the hospital. There was no time for any attention to the bowels beyond the giving of a simple enema. The appendix was found to be acutely inflamed and to be plastered to the posterior wall of the cecum. In detaching it some damage was done to the peritoneal coat of the cecum, which was repaired. One-fortieth of a grain of eserine was given, hypodermically, during the course of the operation. There was very little post-operative nausea, and on the next day the abdomen was perfectly soft and continued to be free from tympanites during the entire period of convalescence. I believe that this happy result was due to the eserine, as my experience in other cases has been similar. I have supplemented the eserine by gastric lavage after anesthesia. This seems to me to be a very helpful procedure. I am confident that since beginning its use I have had much less post-operative nausea and vomiting in my cases.

I wish here to offer a word of caution as to the indiscriminate use of salt solution. I believe that it does as much harm when improperly used as it does good in appropriate cases. Not long ago I saw the autopsy upon a patient who had had large quantities of salt solution by hypodermoclysis shortly before his death. Both pleural cavities were full of a brownish-red fluid which had transuded evidently from the blood-vessels, as the membranes themselves were normal. I believe that there is danger of overfilling the vessels. No one denies its value in many cases, especially where there has been hemorrhage, but it is not a panacea, nor is it the harmless remedy we are inclined to think it.

In the after-treatment of my abdominal cases I allow my patients much more freedom of movement than I did formerly. The nurse is instructed to turn them into the position that they find most comfortable. The dorsal decubitus is disagreeable to many patients, and the change from the back to the side means the difference between a comfortable and an uncomfortable night. The backache which is so disagreeable a feature of the first night after operation is not easy to relieve. Changing the position of the patient, drawing up the knees, gentle friction and the use of some mentholated ointment are the measures I use most, but I cannot say truthfully that they are completely successful.

Since I have been in the habit of using eserine I have not been

so particular about early bowel movements after operation. The main thing after operation is to have peristalsis reestablished, and eserine does this very well. If peristalsis is reestablished the bowels generally move spontaneously or by simple enema. In those cases where meteorism is a prominent feature I have been using lately a remedy recommended by the younger Senn. This consists in the giving of an enema of equal parts of milk and molasses, a pint of each being the proportions I use most commonly.

There is no apparent therapeutic reason for the use of this mixture, but I can testify that it does the work. The result is almost invariably a soft bowel-movement and the frequent expulsion of large amounts of gas, to the great relief of the patient.

In the matter of diet after operation I incline to liberality. If the patient's general condition is good and the pulse and temperature satisfactory I give some solid food on the third day. I cannot see that it does any harm. Of course this is not a routine procedure, but in suitable cases it works well. In any case the diet is increased as rapidly as possible until the patient is getting full diet.

I also get my patients out of bed sooner than I did formerly. A clean appendicitis case is up on the ninth or tenth day, and goes home in two weeks after operation. It is the same with hernia cases. As soon as a patient feels able and wants to sit up I believe that it is well to make tentative essays in this direction. As yet I have not gone so far as Boldt in this direction. He says that when the abdomen has been closed in tiers he allows his patient to get out of bed on the second, third or fourth day after operation, and that not infrequently they leave the hospital at the end of a week. This practice seems to me to be rather too hazardous for use generally.

In summing up the results of my abdominal work, I may say that experience has taught me the necessity of a very thorough preliminary examination of all patients, the desirability of simplicity in technique; the value of rapidity in operating and the benefits accruing from attention to little things.

I present this communication for your consideration in the hope that I may learn from its discussion something which will further these ends.

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THE ASEPTIC REMOVAL OF AN INFECTED FIBROID UTERUS.

BY

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I OPERATED, upon the 15th of February, 1906, on a Miss W., at my private hospital, for a fibroid uterus the size of a small fist, associated with hemorrhages, in which there were strong reasons to suspect an infection of the uterine cavity from the character of the vaginal discharges. Being anxious to avoid any contamination of the abdomen during the removal of the uterus, I successfully adopted the following plan of preventing any escape of any of the contents of the uterine cavity in the act of enucleation and removal.

I first tied off both broad ligaments down to the cervix and the uterine vessels, then in order to hold the cervical stump about to be left, well up in the pelvis, I passed a strong catgut ligature through the tied-off ovarian vessels, under the uterine vessels and out through the round ligaments on each side. When this ligature was tied it served to control the uterine vessels, and at the same time to keep the cervix high up in the pelvis after amputation. An additional ligature was of course applied separately to the uterine vessels. Then lifting the uterus, which was thus freed down to its cervical portion, strongly upwards, I began to amputate through the cervix, first on one side and then on the other, as well as in front and behind. In this way the attachment of the fibroid uterus above was gradually narrowed down to the cervical canal and some of the surrounding tissues until it formed a pedicle about 2 cm. in diameter and perhaps 1 cm. in length. I then grasped the cervical canal thus isolated, but not opened with an artery forceps, and proceeded to amputate just below the forceps with a Paquelin cautery. The uterus was thus removed with its cavity closed in a perfectly aseptic manner. Catgut sutures which had been applied to the right and left angles of the divided cervix before the amputation, were then tied at once, and with several more sutures the stump was completely and promptly closed. The patient since this operation, to which was also added the removal of a large gallstone wedged in the cystic duct, has made a rapid and prompt recovery.

A NEW FORM OF BLOOD CELL.

THE CRESCENT-SHAPED BLOOD CORPUSCLE; AND TWO PERFECT
CONTRAST PICTURES IN HISTOLOGICAL ILLUSTRATION—THE
DECIDUAL CELL STRUCTURE CONTRASTED WITH THE
SYNCYTIAL NUCLEI (LANGHAN'S CELLS) AND
NUCLEAR PROLIFERATION TISSUE.

(A PRELIMINARY COMMUNICATION.)

BY

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(With two plates.)

SOME time ago, in the discussion following the reading of a paper, in reply to some good-natured banter, I promised to prove by histologic specimen that in extrauterine pregnancy there is no characteristic decidual (serotina, reflex or vera) formation. My conclusion was the result of personal study with my own specimens. Scanning the literature for what help it might furnish, I found what all others find even to-day, namely, many forensic discussions with but few facts, this being due possibly to the great scarcity of good, clear histologic illustration.

To Kühne belongs priority, in having first successfully solved the difficulty in correct histologic interpretation of this subject. Kühne advanced the theory that there is no characteristic decidual formation in extrauterine pregnancy; that what has been interpreted as decidual (placental) formation is fetal in origin, not maternal; that it, the pseudo-decidua, is formed by "proliferation tissue of Langhan's cells." In principle, Kühne is right. I differ with him only in maintaining that the so-called Langhan's cell is not a true technical cell, one with nucleus and surrounding plasm limited by a membrane or cell wall; also that the proliferating unit is not a cell, the Langhan's cell, but a nucleus, the syncytial nucleus, for it is the outer row nucleus, in its without-cell-outline plasm, that is especially concerned in this proliferation. Nor is the inner row, the

Langhan's cell layer, made up of true cells; this point I have outlined in a previous paper. What makes this subject of the decidua and its allied questions so difficult to determine, is the fact, as has been so aptly stated, that well preserved, clear and unwounded specimens are so scarce, and difficult to obtain to study with. And again, successful histologic interpretation is hampered because of unfamiliarity with pictures of the normal structures; decidua villi and their villo-decidual attachment.

The studies from which these conclusions have been taken led through a series of histologic specimens commencing with the changes of the mucosa in early intrauterine pregnancy (third-week ovum), to the decidua of maturity and the pseudo-decidua of extrauterine pregnancy (second and sixth week). But not always can one meet the histologic link hoped for. Often much patience, time, and many slides will pass before the successful link is found. At last, I found the one link whose picture I had long sought for. It is very rich in histologic outline and very clear in detail of cell and nucleus. It alone, as a word-picture, speaks so distinctly and decisively as to correctness in interpretation of detail, outline and character of process, that it will be difficult to believe that room for further doubt should longer exist.

Out of these studies a large volume of interpretation and conclusion has been developed. Too large to embody in one paper, it was thought best to subdivide these findings, and create separate papers to cover each subdivision. Thus, "Histology of the Villi" (*AMERICAN JOURNAL OF OBSTETRICS*, 1902) is one of the papers. The other papers are nearing completion. One, "Origin of the Red Blood Plastid" (Minot); the other, "Studies from the Decidua of Intra and Extrauterine Pregnancy."

Since it will be some time before these papers can be presented in full, I have requested our editor to permit three illustrations from this series with their interpretations and conclusions, to be presented at this time, in the form of a preliminary communication.

The first illustration is "the crescent-shaped blood corpuscle" from a six-weeks' ovum. It is not only an original finding, but, so far as I know it is a new discovery. Illustrations 2 and 3 are intrinsically so rich in decisive histologic detail, that their presence here will afford those who have studied the matter opportunity to follow and judge of the interpretation for themselves.

INTERPRETATION.

Fig. I.—Blood vessel from the chorion of sixth-week ovum. From Bauch-Stiel area. (1) Crescent-shaped blood corpuscle. (2) Nucleated blood corpuscle nucleus with slight (apparently) plasm surrounding. (1) and (2) formed one corpuscle—the mulberry form of the metamorphosing nucleated red blood corpuscle. (3) The fully developed or mature red blood plastid (Minot)—the non-nucleated red blood corpuscle. (4) A nucleated red blood corpuscle, characteristic of this period. (5) Nucleated blood corpuscles sectioned at various planes. (6) This nucleus (2) separates from the plasm, leaving a disc-shaped rounded Plasm-body representing the new young red blood-plastid. The latter form is beautifully shown in another illustration of this series, taken from the Bauch-Stiel area of the chorion. It will appear when the paper, "Origin of the Red Blood Plastid," is presented in full.

In the Bauch-Stiel area of the chorion, in the amniotic cavity, there is a trabeculated tissue of arachnoid delicacy. In these meshes I found my first crescent-shaped nucleated blood corpuscle; also many multi-nucleated red blood corpuscles, a metamorphic form of the changing nucleated blood corpuscle. It is this multi-nucleated (three to four nuclei not nucleoli) red-blood corpuscle to which I have applied the term, the mulberry form of nucleated red-blood corpuscle. Further details I hope to present in a future article, entitled, "Origin of the Red-Blood Plastid," in which article I think I will be able to show that the origin of the blood plastid lies not "in the proliferation of endothelia"; "the intracellular connective tissue cell," or, "in the medulla of bone," the three popular theories for the origin of the non-nucleated red-blood corpuscle.

Decidua Serotina.—The decidua cavernosa is shown in Fig. 2 the decidua compacta having been absorbed. (1) The dark border of the decidua is the canalized fibrin, the superficial exudate of the decidua (consolidated by post-mortem and laboratory changes.). This ooze or exudate is analogous to the serous exudate of all inflammatory areas, and here is caused by the irritation of the amebic action of the syncytial nuclei of the villi upon the decidua. (2) Decidual cells, from the large vigorous decidual cell to the degenerating fading decidual cell in the villo-decidual attachment (10). (3) The small dark dots are not alone formed by a round cell maternal exudate of in-



Fig. 1.—The Crescent-shaped Blood Corpuscle.

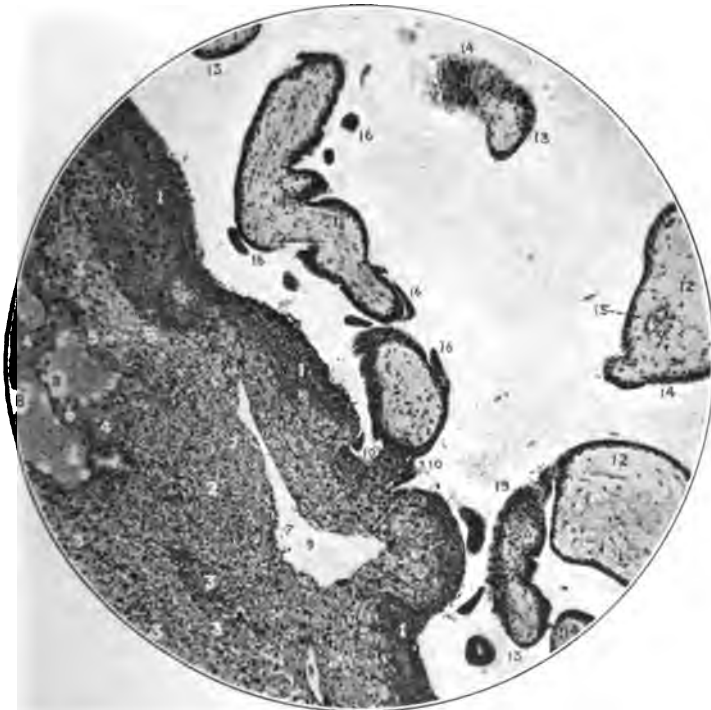


Fig. 2.—Two Contrast Pictures in Histological Illustration—The Decidual Cell and Tissue Contrasted with the Syncytial Nuclei and Proliferation Tissue.

STAHL—A NEW FORM OF BLOOD CELL.

flammatory or irritation nature, but principally they are the invading wandering nucleoli, ectoblasts, from the nuclear divisions of the nuclei of the syncitium of the villi.*

These nucleoli soon develop by amebic growth, into their maturer form (5) like the mature nuclei of the syncitium (10). It is these wandering nucleoli that cause the decidual metamorphosis in the pregnant mucosa, and assist in decidual loss of tone anticipatory of the more active destruction and absorption process of the maturer nuclei (the Langhans cell). These nucleoli are not only found scattered throughout the decidua, but are found throughout the general tissues of the mother. The "cell detritus theory" notwithstanding, and though it is accepted by many as the causative factor of the maternal metamorphoses of pregnancy, I still maintain that these metamorphoses are caused by the inherent qualities of these wandering nucleoli. It is these wandering invading nucleoli with their syncitial plasm covering, possessing

*NOTE.—As it nears and as it occurs in the outer syncitial periphery of the villus, the nucleus seems to have grown in activity, and now contains many nucleoli; the prominent nucleus is not apparent; the nuclear definition disappears, leaving a cell-like cluster of many separate nucleoli.



Liberated into the surrounding muciparous stroma, these small bodies, ectoblasts, are bathed, so to speak, with a muciparous (syncitial) surrounding plasm variable in thickness. These minute ectoblasts wander into surrounding tissues, directly and through the vessels, both in intra- and extrauterine pregnancy. In this aberrant structure of the nucleus (Langhan's cell) lies some explanation of the difference in function between the decidual cell with its apparent distinct limiting membrane and the (Langhans) nuclear cell without such limiting membrane. The large white decidual cell is essentially a defender of maternal tissue; the syncitial nucleus, on the contrary, is a rover, a free-booter cell, which, before it consumes maternal tissue, must paralyze, hence the necessity for a free surrounding neutralizing plasm.

In the intrauterine pregnancy these infant ectoblasts are the advance posts of the villus; by their direct wandering they blaze the way into the surrounding tissues for the advancing villus by neutralizing, breaking down, and making readily absorbable the tissue structures of its environment, the decidua.

In both forms of pregnancy these ectoblasts and their maturer forms functionate like malignoblasts to the maternal tissues, more especially so in the extrauterine pregnancy.

In the intrauterine pregnancy their malignant ions are probably neutralized to a great extent by decidual function.

their peculiar chemico-physiologic function, that forms the unit or the greater part of the unit that induces not only the decidual metamorphosis, but all the other metamorphoses which occur throughout the maternal histology and physiology during pregnancy, and its sequelæ, as hydatid mole, syncytioma and their metastases.

Cohnheim's theory of the origin of tumors is based upon the theory of retention in mature tissues of embryonal elements. One of these elements, I advance, is formed by these nucleoli, which wander, are included and remain latent among mature tissues. When they awake to activity, there is seen an extremely active proliferation of nuclei and nucleoli and a plasm without cell boundary, with destruction to their environment much like that seen in the activities of the nuclei and nucleoli of the syncytium, and in the active proliferation of the nuclei and nucleoli of the carcinomas. Here in the latter case, the carcinoma, there being no antagonistic or inhibitory influence or ion present, like in the maternal organism during pregnancy, there is a rapid nuclear proliferation with amebic function and destruction of environment, followed by the early somatic death characteristic of the malignant growth, whether the growth occur in the neonatus, the child or the adult. Many times I have thought since pursuing these syncytial studies that perhaps from the syncytium, a counter-line or antagonistic ion could be originated analogous to an antitoxine, wherein would be an effective toxine to the carcinoma and allied growths. (4) Nuclear areas surrounding the blood vessels. The normal decidual cell structure has disappeared and been replaced by the now mature syncytial proliferation tissue. This is a characteristic picture of syncytial nuclear attack upon maternal blood-vessels. [In Figure 4 (from *Histology of the Villi Am. Jour. of Obstet.*, Dec., 1902) I show the analogous type of action (eroding effect of syncytial nuclei upon wall of artery) upon the connective tissue of the tube wall, there being no decidual (placental) tissue present to act upon in the extrauterine pregnancy.] (5) Empty spaces, decidual cell interstices, between these nuclear (4) areas; richly invaded by nucleoli, they suggest that these spaces were formerly occupied by decidual cells. Here is seen a honeycomb intercellular outline, whose interstices are empty without plasm or nuclei. Are these outlines of fibrin, or, of connective tissue substance? Apparently o. Then even the decidual cell is not a pure so called technical cell—a nucleus with surrounding plasm limited

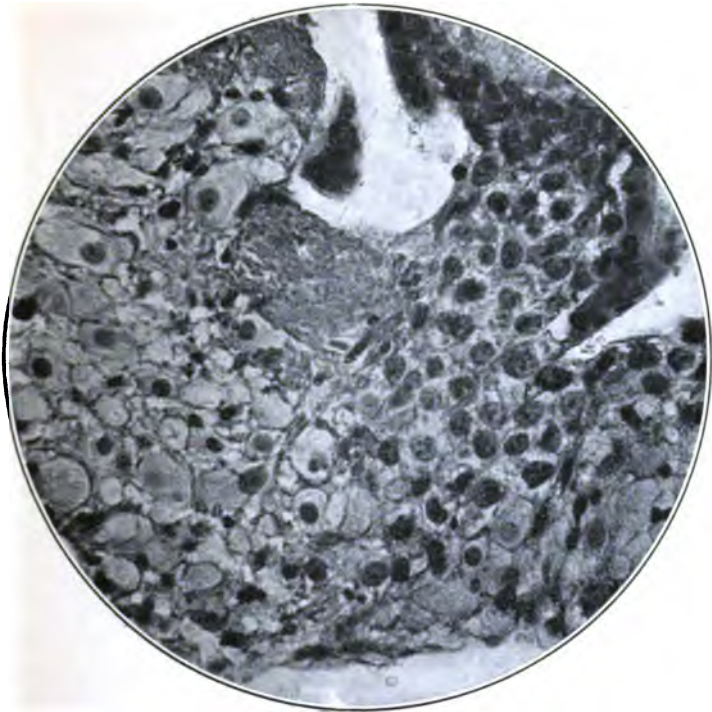


Fig. 3.—Larger amplification of Fig. 2. Villo-decidual.

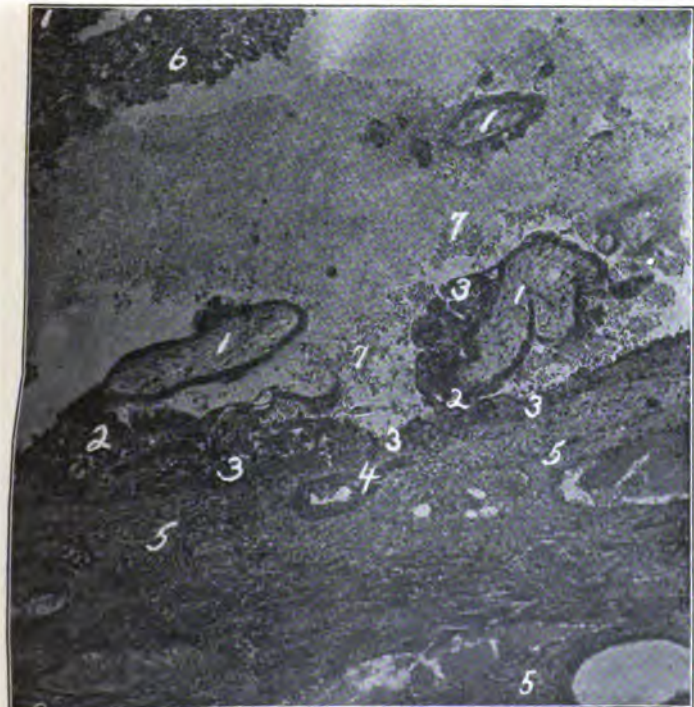


Fig. 4.—Histology of the Placental Villi.
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by a cell wall! It was this picture of the empty decidual interstices (5) that suggested, in my previous article, the doubt that the decidual cell has a true cell limiting wall and there expressed that doubt in the words "apparent distinct cell limiting membrane." (See *supra*.) (6) In the nuclear areas this intercellular honeycomb structure is replaced by a hyaline substance without cellular outline, characteristic of the muciparous stroma of the syncytium. (7) In other areas of this specimen the nuclei of the decidual cells seem loosely placed in an otherwise empty cell space. (8) Decidual blood vessels filled with maternal blood, compare with (15.) (9) Spaces formed from tears. (10) Decidual attachment of a villus, union made up of a merging of syncytial nuclei and plasm, a proliferation tissue of syncytial nuclei (Langhan's cells of literature), from the villus; and fibrin, degenerating decidual cells and connective tissue of the decidua.

The Villi.—Longitudinal (11), cross (12) and oblique (13) sections. Histologic structure is well shown, both the stroma and the limiting syncytium, especially in oblique (13) sections shown here there is no technical cell structure, rather a nuclear digestive function simulating a cell appearance. (10) Tongue of nuclear proliferation (Langhan's cell) tissue uniting villus with decidua serotina. That the nuclei (L. cells) proliferate is emphatically shown here though nuclear (L. cells) proliferation has been denied by some writers. (14) That the syncytium is but the peripheral dense border of the villus stroma is well shown here in the villi (13) whose sections show a superficial oblique plane. There is insensible merging of central stroma into the denser and similar syncytial stroma. (15) Cross section of blood vessels showing nucleated blood corpuscles, the characteristic form of the blood corpuscle at this period (about sixth week) of development. A beautiful contrast is shown here between the blood plastid or the non-nucleated blood corpuscle of the mother (8) and the nucleated blood corpuscle of embryologic period (15). (16) The sprouting buds of the villi show plainly here that the syncytium is solely fetal in origin. }

Nuclear proliferation tissue of syncytium well shown. Notice especially the invading proliferating unit is a nucleus only, there is no cell type to the invading unit. In contrast observe the perfect cell type outline of the decidual cell structure. In a previous article, the observation was advanced that there is no typical cell structure of the syncytium of the villi. This picture in itself argues most eloquently to the point in question

and leaves no doubt that the invading structure is not a technical cell (Langhan's cell), but a free nucleus. Notice in the higher coloring of the nuclei, the suggestion that the nucleus has an active attacking corrosive breaking-down character—an amebic digestive function.

In this villo-decidual tongue where there is concentrated nuclear activity notice the loss of decidual cell demarcation and of tissue. Observe, away from the tongue is seen the perfectly outlined decidual formation already fading because of the presence among them of wandering nucleoli rapidly growing into mature nuclei. The decidual fibrinous exudate is also slowly fading before the nuclear action and villus absorption. Here is shown very plainly the great contrast in histologic picture between the large passive decidual cell and the active invading free nucleus of the syncytium. The maternal structure is characteristically cell-like in outline, with an apparent limiting plasm and membrane, possibly to increase the effectiveness of the cell as a protective agent against the encroaching nucleus of the syncytium. The embryonal structure is a freelance unit, a free nucleus only and not limited by cell walls; most probably to increase its power of amebic action

Fig. 4. Section of Tube Wall, sixth to eighth week of pregnancy. (1) Villi with diffuse (Langhans cell) nuclear (2) proliferation, nuclei without distinct cell wall structure, reaching to (3) pseudo-serotina, made up of nuclear (Langhans cell) proliferation tissue. (4) Eroding (malignant) effect of nuclei well shown, especially toward artery, which is almost perforated. (5) Ectoblasts wandering into all the coats of the tube. (6) Intervillous or bridging tissue made up of proliferative syncytium and nuclei. (7) Maternal blood corpuscles. The fibrin in this illustration of the tube does not rest upon a special metamorphosed tissue like the decidua in intrauterine pregnancy. Here it rests upon the connective tissue of the submucosa, the mucosa and folds having disappeared by amebic action. In other areas the amebic process has extended beyond the submucosa into and through the inner or circular layer of the muscular coat of the tube. Throughout the connective tissue and coats of the tube wall are seen the wandering nucleoli, "blazing the way into the surrounding tissues for the advancing villi by neutralizing, breaking down, and making readily absorbable the tissue structures of its (their) environment." Here the environment of the villi is not a decidual; there is none. Outside of the oval implantation and

near the ovum, its proximal sides and just opposite, the mucosa and folds of this tube are still intact, though slightly affected by the amebic process. Illustrations of these areas will appear in the article, decidua of intra- and extrauterine pregnancy, now near completion.

COLUMBUS MEMORIAL BUILDING.

WHAT INFORMATION CAN WE OBTAIN FROM SYMPTOMATOLOGY IN GYNECOLOGICAL CASES?*

BY

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IN these days of specialism there is great danger of onesidedness and a gradual relaxation of the connection with general medicine, nay, even a complete separation from it. This danger becomes the more imminent the sooner the young physician narrows his domain of activity and assumes the garb of a specialist. To quote the language of the gifted Litzmann: "He then easily sinks down to a mere technician, who in spite of conspicuous performances in his sphere, loses more and more the claim to the name of a physician." It is absolutely imperative, in the case of gynecology, to maintain this connection. Without an understanding of the mental and corporeal peculiarities of woman, independently of her sexual functions, and of their influence on the origin and course of disease, as well as of the manner in which the two factors mutually influence each other, we would frequently, leaving out of view purely surgical cases, be unable to render efficient help in our therapeutical endeavors. It is hardly necessary to call attention to the fact that in gynecology, as in all other branches of practical medicine, success in practise depends chiefly on the accuracy of our diagnosis. That symptomatology may furnish valuable aid to a correct diagnosis, I shall endeavor, as far as I may this evening, to demonstrate, although it does not pretend to enter the field against physical methods of examination, in a word, objective examination.

Of the symptoms which engage our attention very frequently, in a great variety of diseases appertaining to the

*Read before the Woman's Hospital Society at its meeting, November 27, 1905.

sexual organs of woman, are anomalies of menstruation. *Menorrhagia* or *metrorrhagia*, with hardly an exception, accompany hyperplastic diseases of the uterine mucous membrane, *endometritis hyperplastica*, also benignant and malignant tumors which are seated in the mucous membrane. This is especially true of the fibromyomata, whether pedunculated, so as to form polypi, or situated in the walls of the uterus and accompanied by hyperplasia of the mucous membrane. These hemorrhages may attain to such a degree of intensity that the most severe forms of anemia are the consequence. The waxy yellowish hue of countenance of those suffering from profuse hemorrhage, consequent upon uterine carcinoma, in the stage of destructive ulceration, is highly distinctive. Excessive hemorrhage may be the consequence of stasis and strangulation of the mesometrium, as Küstner correctly observes, in deviations of the uterus, in cases of prolapsus, in retroflexions and, in the highest degree, in inversions. The endeavors that have been made in certain quarters to refuse to retroflexio uteri any pathological importance have "certainly shot beyond their aim," as Doederlein* expresses it, "by denying the origin of the hyperplasia of the mucous membrane on the ground of a change of position." I have seen too many cases of profuse menorrhagia in retroflexions occurring in young girls, in whom no other cause could be operative than the backward displacement. The success of treatment directed toward the retroflexion is certainly positive proof of the correctness of this view. The explanation is near at hand. In high degrees of retroflexion there is torsion of the arteries and veins, running in the lower part of the ligamenta lata, in consequence of which, return of the blood from the uterus is obstructed and venous stasis hyperemia is the result; moreover, an important factor in the development of hyperplasia. In most acute inflammations of the genitalia, as in gonorrhea of the uterus and adnexa and in septic conditions, the loss of blood is not usually significant. Under normal conditions menstruation is not attended by a rise of temperature. There may be occasionally a rise of a few tenths at the beginning, but, leaving this out of view, the temperature keeps within the limits of the normal. It is otherwise when an inflammatory process exists within the sphere of the sexual organs. While this is acute and there is a continual rise of temperature, it will be noticed that at the time of menstruation there will be an increase of the fever. When

*Veit: Handbuch der Gynakologie, Zweiter Band, p. 277.

the process has so far run its course that the temperature curve on the chart is normal, fever may still be observed at the time of menstruation. My observations coincide entirely with those of Küstner on this point, and I fully concur in his opinion that this condition of the corporeal temperature, the difference between menstruation and the intermenstrual time, with reference to the temperature, is an important symptom for the judgment of the stage in which para, perimetric, oophoritic and salpingitic processes are, for the time being.

Amenorrhea is a very important symptom and is found in all cases in which the genital tract is occluded, or in cases in which the uterus is absent or is imperfectly developed. Rudimentary development of the ovaries, in which there is no ovulation, even if the uterus is almost normal, necessarily causes amenorrhea. *Secondary amenorrhea* is caused by severe infectious and inflammatory diseases of the uterus and the ovaries. Long lasting, exhausting diseases like pulmonary tuberculosis, nephritis, and diabetes, lead, sooner or later, to *amenorrhea*. It is a very important fact to be borne in mind that amenorrhea is, not infrequently, an early symptom of pulmonary tuberculosis in young women. A few years ago, at a meeting of the New York County Medical Association, the subject of the early recognition of pulmonary tuberculosis was under discussion, and yet not a single speaker alluded to this symptom.

About two years ago a mother brought her daughter to me to seek advice about the amenorrhea from which the latter suffered, fearing, as she expressed it, that her daughter would fall into bad health if something were not done to bring on menstruation. The girl was pale, had loss of appetite, and a slight rise of temperature. At first she denied that she had any cough, but after close questioning admitted that she *did* cough occasionally, but had no expectoration. Nevertheless, examination of the chest showed physical signs of disease of the left apex. Bacteriological examination confirmed the clinical diagnosis of tuberculosis, and before the expiration of six months the patient died.

I need scarce remind you that *chlorosis* plays an important part in the etiology of amenorrhea, and in severe forms menstruation may be absent for years. It cannot be denied that vicarious menstruation *does* now and then occur, while amenorrhea exists, and that periodical bleedings may occur from nose, stomach or rectum, but such cases are exceedingly rare. In some of these cases

there has been deception, and the patient has evolved the symptom to make herself the subject of interesting investigation.

A most important group of symptoms are those comprehended under the term *dysmenorrhea*. It is a theme in itself, and in the limited time at my disposal I can only glance at some aspects of the subject. Permit me to quote from a paper I read before the Obstetrical Section of the American Medical Association, held at Atlantic City, June 5-8, 1900: "In most cases the complaints begin long before the appearance of the period, and reach their highest point in intensity during it, then die away slowly and by degrees. Sometimes the pains come on shortly before the menstrual flow and promptly cease when this begins. Others have the pains only during the flow; still others before and during the period. Some have only a dull burning or gnawing sensation in the pelvis; in the case of others the pains radiate in a wide circle and are perceived at distant parts of the back. In some the pain is more or less continuous, while in others exacerbations alternate with remissions. In many the pains are perceived and described as plain uterine contractions. To these symptoms are often added great irritability of the bladder; the patient has an urgent desire to pass urine every few minutes, and the result of her efforts in this direction are only a few drops. Disturbances of the digestive tract are frequently present; constipation alternates with diarrhea, the latter symptom being the more common. Heartburn, nausea, and vomiting are as frequent as they are annoying. Attacks of severe hemicrania, which may be present for days, give the patient no rest. Cardiac palpitation, cold sweats, and attacks of syncope are manifestations evoked from the circulatory system. If no help comes, her condition may steadily and progressively depreciate. The pains become constant; the fear of the next menstruation, which hangs like the sword of Damocles over the unfortunate woman, the exhaustion that ensues from the pain during the period, the inability to enjoy life and perform properly its duties, and the disappointment at the failure of conception, induce sooner or later a state of invalidism distressing beyond description. The exasperating character of the pains and the attendant depression of spirits often impel the unhappy sufferer to call to her aid a force as potent as it is destructive, in the end, to mind and body; she becomes addicted to the use of narcotics, especially morphine." I do not hold to the view enunciated by most authors that the underlying cause of the phenomena must

be sought in inflammatory conditions of the uterus, its adnexa and their peritoneal investment. On the contrary, I regard *dysmenorrhea* as a neurosis originating when the uterus, finding an obstacle to the evacuation of its contents, responds by spasmodic contraction of its muscles. The great apostle of the mechanical explanation of dysmenorrhea was that rare genius to whose labors gynecological surgery owes an unpayable debt, J. Marion Sims. Both Fritsch and Küstner attack Sims' exclusive mechanical view, but, at the same time, admit that we can moderate or heal the dysmenorrhea if the contractions of the uterus are removed or limited in some degree by eliminating their cause; that is to say, if so easy a way of escape is made for the uterine contents that contractions are not called forth, or, at any rate, to only a limited degree.

A notable symptom with reference to which the gynecologist is frequently consulted is *sterility*. Among the laity the view is still widely prevalent that unfruitfulness in marriage is due to some disease of the woman. This is absolutely incorrect, as statistics have shown conclusively that in a third of sterile marriages the fault is to be placed to the account of the man. When Dr. Sims read his paper before the New York County Medical Society in 1868, upon this theme, and insisted that in every case of sterility it was just as important to examine the sexual organs of the man as those of the woman, he occupied an almost isolated standpoint and was even subjected to severe criticism. The correctness of his postulate is now universally recognized. In man it is necessary to discriminate between *impotentia coeundi* and *impotentia generandi*. In the *impotentia coeundi* the man is unable to secure that degree of erection as shall enable him to introduce the penis into the vagina. This deficiency in the power of erection may depend on local or general causes. To the local belong congenital or acquired deformities and defects of the genital organs. Among the general causes may be mentioned severe general diseases, as *tabes dorsalis*, *nephritis*, *diabetes*, cachexia from wasting disease, abuse of poisons, as alcohol or morphine, finally neurasthenia and temporary psychical inhibition. *Impotentia generandi* is much more frequently found. There are two varieties. In one, *aspermatisms*, the erected penis is introduced into the vagina, but no ejaculation of semen takes place. In the other the semen is ejaculated, but is entirely devoid of spermatozoa; this constitutes *azoospermia*. *Azoospermia* is the

most frequent cause of sterility of the man. It may be due to tumors, carcinoma, sarcoma, atrophy in consequence of cryptorchism, or high degree of hydrocele. Most frequently, so that all other causes sink into insignificance by comparison, it is the result of gonorrheal infection. The *gonorrheal epididymitis* or *funiculitis* is followed by obliteration of the vas deferens, and this, sooner or later, by atrophy of the testicle. Kehrer found by experiments on animals that obliteration of the spermatic cord very soon led to atrophy of the testicle. According to Fürbringer, every man who has suffered from *epididymitis* or *funiculitis gonorrhealis duplex*, will almost surely have, as a final result, azoospermia, the probability being as 9 to 1.

If the cause of sterility lies in abnormal condition of the genital organs of the woman it will be found that it is in the ovaries that furnish the ovum or will consist in changes along the genital tract which present obstacles to the meeting between spermatozoan and the ovum. Ovulation is excluded in cases of defective development of the ovaries, or when they are entirely wanting or remain in the condition of infantile development. The formation of tumors of both ovaries or chronic inflammation, especially of the cortical part, form an obstacle to ovulation. Gonorrheal infection is here most disastrous in its consequences. Gonorrheal salpingitis is alone obstructive to the possibility of conception, leaving out of view the consecutive perisalpingitis and perimetritis which have the effect of interfering to a certain degree with the mechanism of the furtherance of the ovum. Occlusion of the fimbriated extremity of the fallopian tube is a frequent effect of gonorrheal salpingitis. It was a splendid generalization of Noeggerath to have demonstrated the causal relation between gonorrheal infection and sterility in the woman. As one of the most frequent causes of sterility in married women is gonorrheal infection imparted by their husbands, it is within the bounds of truth to maintain that man is the chief factor in the production of unfruitfulness in marriage. Many diseases of the genital organs of woman may present obstacles to the meeting between ovule and sperm-cell, as endometritis, uterine myomata, retroflexion, prolapsus, and inversion, and so cause sterility. Marion Sims assumed as the potent ground for sterility, leucorrhea and ante-flexion. We know that spermatozoa very rapidly lose their vitality in pus. The fact that retroflexions are so often as-

sociated with sterility is largely due to the uterine catarrh always found in this displacement. I need scarcely dwell upon the fact before such an audience as this, that the female sexual organs are frequently accompanied by symptoms referable to the bladder and intestinal tract. How often do we find that condition known as irritable bladder associated with affections of the uterus and its adnexa, leading, at last, to contracture of the bladder? In a purely mechanical way the neck of the bladder may be so compressed by myomata of the uterus that micturition is impossible or in other cases only difficult.

It is a matter of common observation that diseases of the sexual organs of women are frequently attended by obstinate and persistent constipation. Displacements of the uterus and myomata situated in the pelvis are not infrequently mechanical factors in the production of this condition. In the domain of the nervous system exceedingly diversified symptoms manifest themselves, which at times are difficult of interpretation. With Küstner* we may discriminate two chief groups, on the one side the *local nervous affections* or *nervous traumata* in genital diseases, or, secondly, the general *neuroses* caused by genital disease. The first are generally localized in the pelvis and the sensitive part corresponds to the focus of disease, as a rule. There are other painful sensations however, that are not perceived at the seat of disease, but are referred to other parts of the pelvis. In many cases the connection between the focus of disease and the localization of the chief symptoms may be easily understood, as, for example, the extension of a parametric or perimetric process to the plexus ischiaticus makes a sensation of pain in one or both lower extremities intelligible at once. In other cases this causal connection is more recondite. These phenomena Hegar groups together under the term Lumbar Medullary Symptoms. The *lumbar medulla* is the center of most nerve-terminations running in the pelvis. The lumbar medulla constitutes the central organ, from which reflex pains are liberated in places which are remote from the focus of disease.

One of the most difficult problems which the gynecologist is called upon to solve is the relation between the diseases of the sexual organs and *hysteria*. Says Küstner: "The present state of our knowledge of the relation of hysteria to nervous symptoms in far-lying paths which stand in relation to

*Lehrbuch der Gynakologie, p. 446.

sexual disease is the following: Either *hysteria* does not exist previously, the symptoms *depend* directly on the genital disease, or there *exists* hysteria, that is a weakened, labile nervous system, and the genital diseases operate as liberating factors, as *agents provocateurs*." In many cases a course of treatment to the pelvic organs is attended by entire removal of the hysterical manifestations. In other cases in which the hysteria has become chronic, it has become an independent infection, and gynecological treatment is not successful. It must be borne in mind that every neurosis which may be designated as hysterical is not to be referred to a pelvic disease as a reflex neurosis. It has been suggested that in cases of difficulty in the differential diagnosis as to whether the symptoms depend exclusively on diseases of the sexual organs or whether they are only brought into prominence by the coexistence of hysteria, it were well to have the advice of a neurologist. At all events, this is common ground in which neurologists and gynecologists might meet for the exchange of views to their mutual advantage.

It is doubtless possible that in a certain class of cases in which genital diseases exist and functional nervous affections are found together, it is simply a question of coincidence and not one of dependence. There is no means at our command so certain as a careful analysis of all the symptoms to reach a right conclusion in such circumstances of difficult diagnosis. It repeatedly happens that the symptoms alone point to the right diagnosis before calling to our aid physical methods of examination; thus pain in the top of the head, leucorrhœa, backache, painful sensations and phenomena of paralysis in the lower extremities, from direct pressure on the plexus ischiaticus, plainly suggest retroflexio uteri before having recourse to bimanual palpation. In rupture of the tube consequent upon tubal pregnancy the phenomena are so marked and so characteristic that the diagnosis is obvious. The field is large and productive and, as you will perceive, I have only gathered a few sheaves, but this paper is intended to be suggestive rather than *exhaustive*.

WHAT INFORMATION MAY WE OBTAIN FROM SYMPTOMATOLOGY IN GYNECOLOGICAL CASES WITH SPECIAL REFERENCE TO BACKACHE.

BY

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In analyzing pathological conditions as we daily meet them in gynecological cases, our efforts are directed toward securing symptoms subjective and objective of existing disease. Subjective symptoms alone do not direct us with any degree of certainty. Combined however with objective symptoms, they become invaluable in determining causes. The subjective symptom, backache, like headache and nausea, may depend upon one or many causes. It is, however, a common mistake of beginners in gynecology (in fact one too often made by men of some experience in this special branch) to attribute this symptom to the first objective sign discovered. Thus injuries to the genital tract being easily recognizable are without further investigation erroneously pronounced the direct and only source of disturbance, and disappointment to both patient and surgeon follow even when the injuries are repaired to a nicety, the active factor or factors having escaped attention. Conditions such as malposition of the uterus, lacerations of the cervix or perineum, etc., do not of themselves justify operative interference. Before active means for the restoration of these abnormalities are considered, we should first determine whether they are the occasion of sufficient disturbance to necessitate repair. It is a well-known fact that displacements and injuries to the soft parts are often discovered accidentally, the patient having previously experienced no special distress. Repair, therefore, should be undertaken only when there exists such subjective symptoms as can with reasonable certainty be attributed to one or more of the conditions discovered.

In other words, abnormalities may exist without occasioning symptoms sufficiently distressing to justify surgical interference, and we should only act when these conditions are pathological in the sense of causing distress.

But what information may be obtained from the symptom backache?

*Read before the Woman's Hospital Society, November 27, 1905.

Like other subjective symptoms, it may be due to innumerable causes. Alone, it imparts no positive information, and even when grouped with other symptoms of its class, it is at best but suggestive. There must be associated with it certain conditions, such as floating kidney, retrodisplacement of the uterus, or pathological injuries intra- or extraabdominal, to make it of value in directing our inquiry. There are certain intraabdominal pathological injuries which are obscure, and consequently confusing to the diagnostician. Often these are undiscoverable until the abdomen be opened. I refer to a class of cases in which the condition is the result of inflammatory action in the peritoneal cavity following infection from a previous operation, or through the genital tract, or intestinal canal. These cases are by no means rare, and to aid us in diagnosis we have at times only subjective symptoms. Backache and previous history in regard to a possible infection may be our only sources of information. The distress in these cases is occasioned by the union of two or more surfaces normally free, the adhesions limiting motion of the abdominal or pelvic organs, and interfering with the distribution of intraabdominal force. Injuries to the genital tract alone may occasion backache, but diseases of the appendages and malpositions of the uterus bearing often causative relationship to these injuries are frequently factors more potent.

In our teaching it behooves us to emphasize the importance of thorough search for all causes, both active and contributory. Backache is not commonly found conspicuously associated with acute gynecological diseases, excepting in acute retrodisplacement and inversion of the uterus.

In such conditions as acute peritonitis, acute salpingitis, pelvic hematomata, etc., the chief distress is general pelvic pain; backache may exist, but to a comparatively mild degree, and is overshadowed by the more severe pelvic pain. It is, however, the constant and periodic form of backache which is most often brought to our notice. The former is commonly associated with extensive lacerations of the genital tract, prolapse of the uterus, and retrodisplacements, and often associated with chronic metritis, edometritis, chronic diseases of the appendages, and adhesions of peritoneal surfaces. The latter, or periodic form, appearing during the menstrual epoch, is commonly associated with ante flexion, endometritis, chronic inflammation of the tubes and ovaries, and adhesions involving the appendages. Backache is found more constantly in retrodisplacements than in any other

form of the many gynecological diseases. In the acute form of retrodisplacement, tenesmus is a conspicuously associated symptom; in the chronic form the associated symptoms are more numerous and varied, but backache predominates.

If finally it be permissible to digress a little from the immediate subject under discussion, I would remind you of a common error, in our early training, which to-day should not be encouraged. As gynecologists we were trained to confine our surgical work and investigations to the organs of the pelvis. The kidneys, the gall-bladder, and even the appendix were then considered out of our legitimate sphere, and so our acquaintance with them and their diseases was comparatively limited. The gynecologist of to-day, however, who confines his work to the pelvic organs, but half prepares himself for the necessities of the patient seeking his advice and assistance. He should be ready to successfully meet any and all conditions arising in the domain of both pelvic and abdominal surgery. What more the future may exact of him is difficult to foretell, but the field of his activities must grow, for skill increases with experience, and knowledge, a tireless mistress, is ceaseless in her demands.

49 WEST THIRTY-EIGHTH STREET.

CONGENITAL ABSENCE OF LOWER THIRD OF THE
VAGINA, A SHALLOW, BLIND SAC OCCUPYING
THE VAGINAL INTROITUS. THE CREATION
OF A CONTINUOUS VAGINA PARTLY BY
THE VULVAR AND PARTLY BY THE
ABDOMINAL ROUTE.

BY

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(With three illustrations.)

I FOUND it difficult to place the case I am about to describe in any of the classifications of malformations of the vagina. Cases resembling mine are usually defined as cases of atresia of the vagina or of absence of the vagina. It does not truly belong to either class. There is stenosis of the introitus, if you will, and there is stenosis (I advisedly employ the term stenosis in preference to atresia, for where there is an opening, no matter how

small, the condition cannot be termed atresia) of what there is of a vagina. But in addition to all this there is an arrest of development of the lower part of the vagina, so that the vaginal canal forms a sac of greater or less size about the vaginal portion of the cervix, then comes an area occupied by loose cellular tissue, and lastly a thick fold of mucous membrane forming a blind sac of greater or less depth, filling the space formed by the vulva.

There is thus between the false lower vagina or blind sac and the true upper vagina a space of varying depth, filled with cellular tissue. In the three cases of the kind that I have observed there was evidently an opening in the true vagina and another of very small dimensions in the blind sac, so that the menstrual fluid could find exit, though with considerable difficulty. Accordingly, in none of these cases was there any marked retention of blood in the genital canal.

Cases presenting this anomaly would seem to furnish, off-hand, evidence in favor of the theory of the development of the hymen advanced by Pozzi, and which embryologists as a rule have not accepted. Pozzi holds that the development of the hymen springs from the "Anlage" that goes to form the external genitals. Whether this theory is well founded or not it is certain that in cases of true absence of the vagina a hymenlike structure may exist, lying in contact with a fold of mucous membrane which stretches across the rima pudendi and forms a depression of varying depth. Such a blind sac was found in two cases of mine in which there was no uterus and no vagina, as I was able to determine by a laparotomy in each case. It is evident, therefore, that a blind sac and a structure resembling a hymen may form independent of the development of the vagina.

Hence, from an embryological standpoint, my case can be easily explained. That all degrees of arrest of development of the vagina may occur is well known. If the development may be so faulty that only a mere vestige of a vagina is found, it can readily be understood that the faulty development may also result in a vagina reaching half or two-thirds the way down to the vulva. The formation of the blind sac across the rima pudendi would occur similarly, as if there were a total absence of the vagina. In any case the facts of the anatomical condition speak for themselves, and it is for the embryologists to satisfactorily explain them.*

*Loefqvist (*Ausgebildetes Hymen bei Defect der Vagina Mitt. a. 2. Gynaek. Klink. Vol. 10, 227-239*), who has given especial study to the

The true anatomical relations in these cases are not generally recognized, and the condition is commonly interpreted as an atresia or stenosis of the vaginal canal. As a result of such misinterpretation the surgical treatment that is accorded to these cases is based on wrong principles. An incision is made into the blind sac, dissection is carried into the cellular tissue beyond and an effort is made by various devices to prevent contraction of the newly formed canal. The outcome of such intervention is either total failure, for the contraction of the wound recurs within a short time, or, what is worse, the cellular tissue between the bladder and rectum becomes infected, the infection spreading rapidly to the pelvic contents and the patient becomes the victim of double diseased adnexa, with extensive exudates and adhesions.

A patient in Mt. Sinai Hospital during the year had been subjected to such intervention before entering the hospital. She had, as a result of that intervention, pyometra and double diseased adnexa. So serious and extensive was her infection that, in spite of the closest attention and the operative skill of Dr. F. Krug, she succumbed to her infection after a lingering illness.

A similar case came under my own care during my term of service last summer, through the courtesy of my colleague and friend, Dr. A. A. Berg. An operation had been performed upon her some time before her admission into this hospital to overcome the obstruction. The artificial opening had almost closed again and the patient had become infected. When she came under my care the whole pelvis was filled with inflammatory masses. At the operation there were found double pyosalpinx and extensive adhesions of the intestines to the uterus and adnexa. In my anx-

subject of the presence of a hymen in cases of absence or defect of the vagina, and who reports 10 cases observed in Engstrom's Klinik, inclines to the theory of Schaeffer and Klein. These authorities hold that the hymen is a structure which owes its formation partly to the vagina (Müller's ducts) and partly to the urogenital sinus (the ectoderm). Loeffqvist has not been able to determine from his embryological studies whether the hymen is a bilamellate structure, as affirmed by Schaeffer, but he was able to deduce from them that the external part of the hymen develops from the vulva. He goes on to say that the vestibule vagina has its origin in the ectodermal "*anlage*." This also goes to form the external lamella of the hymen. Now, when the Müller's ducts for some reason remain behind in their development, the rectourethral septum does not sink in its natural way toward the urogenital sinus, and the usual meeting together of the tissues which occurs normally does not take place. The ectodermal *anlage* does not find any vagina, its external lamella forms the hymen in the usual way, and its middle portion forms out of necessity a greater or less depression, which is covered with the same epithelium as that of the entire vestibule. Besides, the size of the stated blind sac varies markedly. To this may be added another factor later in life, that the depression is increased in depth by mechanical means.

iety to conserve some of her pelvic organs (one of the ovaries was in fair condition, though buried in adhesions) I made the fatal error of leaving the uterus and the one ovary behind, in the hope that at a later date I could create a continuous vagina. The patient was in a wretched physical condition and came nigh succumbing to shock. She rallied from this, however, and did fairly well for six days, then began to run high temperatures, and died five days later from combined sepsis and oozing from the new surfaces in the pelvis.



Fig. 1.

About the same time a patient came under my care in Mt. Sinai Hospital in whom the same anatomical conditions existed as in the above two cases, but in whom, fortunately, no attempt had been made to overcome the so-called atresia of the vagina. I had, therefore, a perfectly clean case to start with and deemed it a suitable one to apply the procedure I had in view in the event of my not being able to reach the upper vagina by dissection from below.

Mrs. I. B., 24 years of age, married three months, admitted into Mt. Sinai Hospital July 7, 1905. She had had measles and scarlet fever in her childhood. The menses appeared in her fifteenth year and were irregular for the first year. After this they recurred regularly every four weeks, lasting five or six days, but were very scanty and attended with slight pain. She sought admission into the hospital on account of unsatisfactory sexual intercourse and on account of great pain when the act was attempted. She was of medium stature, well nourished, and presented a normal feminine appearance. The external genitals were fairly well developed. Instead of the usual vaginal canal there was a blind sac about 2 cm. deep, in the center of which was a small, circular opening just large enough to admit a medium-sized probe. On examination per rectum a uterus of about normal size and shape and in the forward position was made out. The adnexa on either side were palpable and seemed to be normal. It was not possible to determine by the examination whether a vagina existed or not.

July 18, 1905, after the usual preparation for a laparotomy, the patient was subjected to operation. At first the opening in the blind sac was enlarged by cutting away a rim of the tissue encircling it. In this way it was thought that if the condition was one merely of stenosis of the vagina the upper portion of the vagina would surely be entered. Instead of finding the mucous lining of a vaginal canal, cellular tissue only was encountered. By careful blunt dissection, frequently recurring to the landmarks of the bladder and rectum, a depth was created nearly the finger's length, but the vaginal portion of the cervix was not exposed. It was evident that the dissection was being carried into the cellular tissue between the uterus and rectum. With the finger the vaginal portion was felt, but intervening between it and the finger was a fairly thick membrane which was looked upon as the wall of the upper vagina. The parts were well exposed by retractors and an effort made to cut into this membrane, but with the sound in the bladder and a finger in the rectum it did not seem feasible to do this without running great risk of injuring one or other of these structures. It was further felt that if one were even willing to take this risk, the upper vagina would not, in all probability, be entered at its most favorable point to carry out the procedure in view. Accordingly it was deemed safest and best to proceed with the course of action mapped out in the event of its not being a mere stenosis of the vagina, or if the true but rudimentary vagina could not be readily entered from below.

The abdomen was therefore opened by a median incision, the uterus and adnexa were inspected and were found normal. The bladder peritoneum was then cut across just a little above its reflection and the bladder pushed down from the cervix, as is done in hysterectomy, the stripping being continued for a considerable area beyond the vaginal portion. The finger located the tip of the cervix and a transverse incision was made just beyond it,

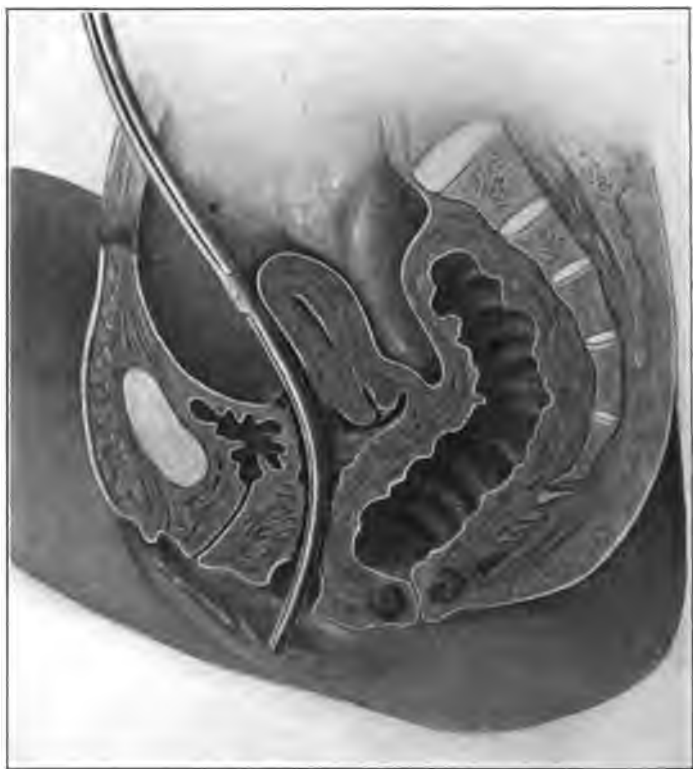


Fig. 2.

entering the true upper vagina. The vaginal portion was found rather short, the lips were everted and presented a considerable erosion. The vault of the vagina, both behind and in front of the cervix, was unusually shallow. The above incision entered a fairly capacious upper vagina, which was not distended but contained a small quantity of dark tarry fluid. This was mopped away, and a dressing forceps was carried through the incision

into the vagina and pushed downward and forward in the direction of the vulva, the point of the instrument being guided by the fingers of the left hand in the space made by the dissection from below. When the point of the instrument emerged at the vulva a strip of iodoform gauze was placed in its grasp and the instrument was withdrawn. The upper end of the strip of gauze was loosely packed in the upper vagina and the lower end allowed to hang out at the vulva. The incision into the vagina from the abdominal side was sutured, as was also the bladder peritoneum to the site at which it had been incised, and the abdominal wall closed in the usual way.

The next and final step of the operation was thus rendered simple. The strip of gauze served as a guide to the opening in the upper vagina, which, from the manner it was made, was naturally at its most dependent part. This opening was enlarged to a suitable dimension and its edges were united in a circular manner by interrupted chromicized catgut sutures to the edges of the mucous membrane forming the blind sac. In this way a continuous vagina lined by mucous membrane was created, admitting readily two fingers and of a depth corresponding almost to the length of the index finger. The united edges healed primarily, as did the abdominal wound. When the patient left the hospital, three weeks after the operation, an ordinary sized bivalve speculum could easily be introduced and the cervix exposed with ease.

December 2. Patient presented herself for examination. The anatomical result is simply ideal. The index and middle fingers can be readily inserted to their full length, and anyone making the examination for the first time would scarcely believe that there had been a malformation. The only feature one could recognize was that the fingers were a trifle more closely embraced by the vagina at its upper third than elsewhere. The patient stated that the act of coition was now satisfactory in every way and was not attended with any pain. The menses were regular, and attended with the same degree of pain as before the operation. I regret now that I did not curette the uterus at the time of the operation, as there is still some erosion of the cervix and a moderate leucorrheal discharge.

The foregoing case was under my care during the hot summer, when one has neither the energy nor inclination to do more than the actual work at hand. I therefore did not look up the literature of the subject then, and was inwardly congratulating

myself upon the probability of having hit upon an original method of dealing with these cases. Later, however, when I had time to look up the literature I found I had been anticipated by at least one operator—J. Pfannenstiel (*Beiträge zur Geb. u. Gyn. Festschrift von Fritsch, 1902*).

Pfannenstiel's case dealt with a young woman, 21 years of age, who had never menstruated. The vulva was of normal develop-



Fig. 3.

ment. The vagina formed a blind sac 1 1-2 cm. deep: Examination under narcosis revealed the presence of a uterus and adnexa, but the existence of a vagina could not be definitely ascertained even with a thorough examination through the rectum. The operative procedure consisted, first, in making an incision through the blind vagina and carefully dissecting bluntly upwards towards the cervix. After this had been carried for a distance of 5 or 6

cm. the portio was reached, but covering it was a membrane. By locating the boundaries of the bladder with a sound introduced into it and the rectum with the finger, he found he did not dare to cut into this membrane, for fear of injuring the bladder.

He next opened the abdomen, made an incision through the anterior wall of the uterus to ascertain if it contained blood, but found it empty. He then separated the bladder from the uterus and entered the upper and true vagina by an incision in front of the cervix. He found a very rudimentary portio with a closed os. Next he passed a sound through the opening in the uterus and pushed it through the cervical canal and closed os, making the end of the sound appear at the vulva. A ligature was tied about the end of the sound to serve as a guide to the opening in the true vagina. The remaining steps of the operation were precisely similar to those carried out in my case. When the operation was completed the new vagina measured three-fourths of the length of the index finger. Three years later the vagina readily admitted the index finger to its full length.

Engström (*Mittheilungen aus der Gynekologischen Klinik des Professor Engström*, Vol. IV, 241, 1902) relates an instance in which G. Heinrichius in a similar condition performed a laparotomy, cut into the true vagina behind the cervix and pushed a blunt instrument towards the vulva. In doing this, however, he injured the bladder.

After a pretty thorough search of the literature these two are the only instances I have been able to find in which a similar operation to the one I executed had been put into practice.

When a condition exists corresponding to that present in my case the operation (I mean the abdominal portion) should always be done when one fails, after a careful dissection, to reach the upper vagina from below. One might safely even go further, and say that the operation should be done in every case, for it is only by this technique that one is certain of making the opening into the upper vagina at the most favorable point; that is, at the greatest distance from the tip of the cervix, and thus the edges of the upper vagina can be more easily sutured to the edges of the membrane forming the blind sac, and with less likelihood of their cutting through on account of too much tension. It can be correctly deduced that there is a vagina, no matter how rudimentary, about the cervix, when a fairly developed uterus is present. True, absence of the upper vagina occurs, according to my experience,

only when there is practically an absence of the uterus, or when that organ is represented by one or two small solid bodies varying in size from a kidney bean to an almond.

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ABSENCE OF THE UTERUS ASSOCIATED WITH BI-
LATERAL OVARIAN HERNIA AND
VICARIOUS HEMORRHAGE.*

BY

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THE following case seems worthy of record because of its extreme rarity. Moreover, apart from its anatomical deviation from the normal, it has some bearing on the question of vicarious menstruation—a subject which excellent authorities have from time to time either ridiculed as legendary, or advocated as a recognized fact. Much of the literature which has been contributed on this topic is unsatisfactory and has a tendency to leave the reader in doubt as to whether a careful differential diagnosis had been made by the physician reporting the case. In many instances it would seem that gastric ulcer,¹ cardiac insufficiency, hysteria, phthisis, diseased gums or mere coincidence depending upon some existing disease, would have been a more accurate diagnosis, than to have pronounced the case one of vicarious menstruation.

A predisposition to capillary hemorrhage which bursts into some remote part, the discharge of blood from a facial nevus,² which may have been superinduced by the added congestion coincident with the increased blood pressure at the menstrual period, is not convincing evidence of an ectopic menstruation. The frequency with which this phenomenon seems to be associated with the hysterical, anemic, underfed and undernourished type of the lower class makes us doubt at times the veracity of their statements. Such an event occurring only once,³ or three attacks of "vicarious menstruation from the retina"⁴ ending in death, is certainly too vague and unsatisfactory in differential detail for us to accept the evidence submitted without a grain of salt. Moreover, the term vicarious menstruation is, in many respects, an

*Read before the Southern District of the Chicago Medical Society, October 12, 1905.

unfortunate one. Menstruation conveys to our mind a periodical sanguineous discharge from the uterus. A nomenclature which embraces a vicarious hemorrhage from the umbilicus,⁵ a vicarious hemorrhage from the external auditory meatus, the mucous membrane of the lower lip,⁶ a vicarious lacteal secretion from the breast,⁷ a vicarious diarrhea, and a copious leucorrhœa, vicarious in nature,⁸ at the onset invites criticism as well as confusion. A vicarious secretion would be more suggestive of the several modes of drainage which nature has at various times established as a safety valve for the tension, a subtle nervous force has formed the habit of relieving periodically by the means of a menstrual flow.

In the literature on this subject several classically written articles stand out with clear definition and scientific detail. Winthrow's article,⁹ including a report of three typical cases, of "congenital amenorrhea and vicarious menstruation," notably belongs to this latter class. He concludes that the heightened development of the thyroid gland and the breasts, the increased blood pressure, the fullness of the pulse, the irritability and increased tension of the nervous system, warrant us in the inference that "a condition of abnormally high pressure or vascular fullness or plethora may produce a vicarious hemorrhage from some 'locus minoris resistantiæ.'"

CASE.—A woman presented herself at the gynecological clinic of the Northwestern University, August 14, 1900. She was born in Northern Germany 28 years before, was single, and weighed 136 pounds. Occupation, housekeeper.

At the time of her admittance to the clinic she complained of amenorrhea, paroxysmal congestive headaches, associated with dilatation of the capillaries of the face, nervousness, and hysteria. Several weeks previously she had been obliged to give up her position as housekeeper, on account of bearing-down pains in the pelvis, which were so intense that she was unable to stand on her feet. She entered the clinic in a crouching position. Her distress was relieved when she sat in a chair, and almost disappeared when she took the reclining position on the examination table.

Family history negative. Father and mother still living. She has five sisters and two brothers. Eldest sister 43 years of age, married, and the mother of six children. Two younger sisters are unmarried. Patient is of the impression that they are normal in every respect. One sister died in infancy, another at 15 years

of age, of tuberculosis. One brother is 36 years of age, has been married ten years, has no children. The other brother, 26 years of age, is unmarried. There are two aunts on the mother's side, both married many years, no children. One cousin on mother's side, married, no children. Another cousin on same side developed a double inguinal hernia after the birth of her first child.

When patient was an infant of nine months, her sister in play threw her violently on the bed. Patient's arms were stretched out and her back was bent. She screamed in great pain and cried for several hours afterward. At that time the mother said "a little lump popped up" in the inguinal region. The family physician was consulted and diagnosed a hernia, but as she evinced no discomfort after a few days, no further attention was paid to it.

At 14 years of age the usual signs and symptoms of puberty manifested themselves. Her breasts became enlarged and tender, she was nervous and at times hysterical, and during the periodical molimen she was subject to headache, nausea, and vomiting. Between the ages of 14 and 15, during one of these periods, she had a profuse nosebleed with a coincident relief from all the subjective sensations of menstruation. Since that time to the present date the vicarious hemorrhage has been constant so long as the patient enjoyed good health. When a monthly period was passed without a hemorrhage from the nose, she became excessively nervous and hysterical, she suffered with full, heavy sensations in the pelvis, and severe congestive headaches.

With years, the lump in the right inguinal region had a tendency to become larger. When she was 20 years of age she fell off a step-ladder and "strained her right side." Not long after this, while skating, she fell on some ice and again "strained her right side." About this time she noticed a small lump appearing in the left inguinal region, but it did not cause her as much pain as the enlargement on the right, and unlike it, did not disappear on reclining. From then on she suffered with unusual periodical distress. The bearing-down pains became so severe that she suffered intensely in the upright position, her headaches increased in violence, the epistaxis ceased, and she was fast becoming a nervous wreck.

About a year before she appeared at the clinic one of her charges, a young boy, kicked her in the abdomen, and she suffered exquisite agony for several hours. The right protrusion in the inguinal region increased markedly in size, and the sensations she had for-

merly experienced only at the so-called menstrual periods were inclined to be constant. She had decreased in weight from 160 to 145 pounds.

Both in appearance and in actions the patient presented the extreme feminine type. She was unusually demonstrative and affectionate. She reluctantly confessed that she had masturbated since she was 15 years of age, was very fond of the society of men, and discovered the malformation of her genitalia by an attempted coitus which could not be consummated.

The patient was extremely sensitive regarding her affliction, and she had not previously confided the fact that she had never menstruated to anyone but her mother. She came to the clinic for what she supposed was a hernia, and not appreciating what was meant by a local pelvic examination, gave her consent to it.

Abdominal examination demonstrated a tumor in both inguinal regions about the size of an English walnut, extremely sensitive to touch and not reducible. Otherwise, negative.

Inspection of the breasts showed them to be unusually well developed, with the exception that there were no nipples.

Inspection of the external genitalia revealed an infantile vulva. Scanty pubic hair. The clitoris, urethra, labia minora and majora, were of the infantile type and in their proper relations.

Vaginal examination showed a small vaginal pouch one-half to three-quarters of an inch in length. There was no cervix uteri in the vault.

Bimanual examination per rectum failed to demonstrate a uterus.

Operation.—The writer assisted Dr. T. J. Watkins in the operation for inguinal hernia. An incision was made over the tumors and double ovarian inguinal hernia was demonstrated. The openings were extended through the internal ring of the abdominal wall, and the pelvis was explored. The uterus and Fallopian tubes were absent. The right and left ovaries were normal and were found in the hernial sacs. They were separated from their fibrous attachment and dropped back into the abdomen. The wound was closed with silkworm gut sutures.

The immediate recovery from the operation was uneventful.

Six months afterward the patient had gained twenty-five pounds and was in excellent health. The general symptoms of a precursor of a menstrual period made their appearance with monthly regularity, and were relieved by profuse epistaxis. Twelve months after the operation the patient was still in the same health

and weighed 180 pounds. Within the past year the writer again saw her. She had maintained her health, and consulted him about the prospect of an operation which would provide her with an artificial vagina and thus enable her to marry a man whom she said would waive the prospect of her bearing children. This suggestion was discouraged, as there was no ethical excuse for the procedure under the existing circumstances, the patient being unmarried; the prognosis for the ultimate success of the operation would not be good, and I did not believe in submitting the patient to the dangers attending an unnecessary elective operation.

In reviewing the details of this case, two questions prominently present themselves for consideration. First, was the uterus entirely absent? Second, was there a possibility that the patient belonged to the male type of the pseudo-hermaphrodite—were the contents of the inguinal hernias ovaries or testicles? In considering the first question, the writer can only say that in addition to the bimanual rectal examination, which failed to elicit a uterus, a careful intraabdominal examination was made at the time of operation, corroborating the absence of the uterus or Fallopian tubes. There is a consensus of opinion that the absence of the embryonic remains of the uterus due to normal retrogressive changes can only be demonstrated in post-mortem examination. This would especially be the case where there was only a fibrous band on the posterior wall of the bladder, and might escape direct, much more indirect, palpation.

In answer to the second question, unfortunately a section of the contents of the hernias was not removed for microscopical examination. Macroscopically the contents resembled apparently typical, well-developed ovaries, with Graffian follicles. Taken in conjunction with the fact that the patient was feminine in appearance, the head, thorax, pelvis, arms, legs, and hands were distinctively feminine; that there was no hair on the face; the voice was low and soft; the breasts well developed; that she was demonstrative and affectionate in disposition; markedly hysterical in type; that she had the normal female urethra in its proper position, and the external genitalia, while infantile in development, was normal in every particular, while none of the elements suggestive of the masculine could be detected, we would be warranted in the presumption that the patient in question was distinctively feminine in type.

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CANCER OF THE BREAST.*

END RESULTS IN TWENTY-FIVE CASES. DEMONSTRATION OF A
NEW FLAP METHOD.

BY

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THIS disease is the most dangerous and deadly of all the maladies to which the sexual organs of women are subjected, with the possible exception of uterine cancer. The breast is exposed to injury; and in many women is constantly changing in size or influenced by some reflex or sympathetic cause. It is in close sympathy with menstruation and it shares with the uterus in the changes incidental to pregnancy and the puerperal state. We know but little of the relation of heredity to cancer, but personally speaking we have no confidence in the theory, and in fact believe that parasites enter the nipple of many women, and in some, where there are favorable conditions the disease manifests itself, and in others it fails to find a lodgment. As we know so little of its causation we propose to regard the disease "parasitic," because that definition comes nearer to the present understanding of its manifestations. Women having born and nursed children are its most frequent victims. It is mostly frequently seen at the middle period of life, when the breast, like the uterus, is undergoing retrograde changes. We know of no kind of food, nor do we know of any circumstances which may favor the development of the disease or restrict its ravages. Age has some influence in the development of cancer for, happily, it is a rare disease in women under thirty years. We believe that its frequency at the middle period of life is confirmatory of the position stated above. It is more

*Read before the Washington Obstetrical and Gynecological Society November 17, 1905.

than probable that the parasites may remain within the breast indefinitely and here await the time of least resistance for their attack, as is said of the tuberculi bacilli. We observe that the disease proceeds from without inwards and that it seldom if ever comes from within outwards. It is a fair presumption that the disease finds a temporary resistance in most instances, and that a protecting wall is thrown out which for a time checks the disease. But this wall, or bulwark of cells, forming a protective zone, finally gives way to the attacks of the unrelenting invaders and the zone now becomes a depot or station of supply from which the hosts of cells are sent out in every direction until the lymph stream is involved. If there is any way to explain the development of cancer after injury, or ulcer," it may best be understood by applying this parasitic theory.

Diagnosis.—We should have little difficulty in making a diagnosis in these cases. The present tendency is to operate upon every case and to call it cancer until the microscope decides between the benign and the malignant tumors. We consider this a harsh and rude method, born of the liberty taken by ruthless and reckless surgery. In women under thirty, almost all tumors are benign with the exception of sarcoma, or possibly tuberculosis. These benign tumors will often be found encapsulated, movable, and free from the surrounding tissues. Even in older women who are in the cancer age, there is no excuse for the amputation of the breast for an innocent fibroma. Our advice is to use cocain anesthesia for the removal of such tumors and then have the proper microscopical examination made. We do not remember to have been mistaken, nor have we regretted having done so, but we have occasionally removed the breast for tumors which had no capsule and where the growth so closely imitated cancer that operation was done radically, and of course, unnecessarily.

In mentioning our own cases it is with much regret that we have been able to hear from such a small number of our former patients. We have observed that our breast cases come from a better class than the average free or dispensary patients, and we are the more disappointed to find them careless or indifferent regarding the report they solemnly promised to forward from time to time. However we believe that of the twenty-five patients operated upon by the Halsted or Myer method from April 27, 1898, to March 2, 1903, twenty are alive at the present time. Of this number, three are known

to have a recurrence. Twelve of the patients have reported their condition or are otherwise known to be in good health. This leaves a margin of five from whom only indirect reports were received, and which are not considered reliable. During the time of axillary dissection or when the pectorals were not removed we found a number of excellent results. From June 6, 1893, until the time mentioned, 1898, when we adopted the Halsted method, seven operations were performed for carcinoma in which the dissection was carefully done but without taking away the muscles. These were dispensary patients however, and we made no effort to follow them up for future reference. Only one of them is known to have had a fatal result.

Recurrence.—After operation recurrence is said to be far more frequent in the rarer forms of cancer such as the melanotic and tubular varieties, but we have had no experience with such cases since we have used Halsted's method. We have no report of any case of recurrence in the axilla after a dissection of that space. We have seen a few recurrences in the skin which thus far have all been saved.

One of my cases of great interest occurred in a widow, aged 35 years, who had recently contracted a second marriage. Both breasts were removed within a year for cancer, and later she bore a child which was defective and finally died. A second child was born two years later, is now three years old, and is perfectly healthy. It is now eight years since her first operation.

It is with the greatest satisfaction that we observe the excellent results of Halsted's operation upon the mobility of the arm. The extent of motion is almost normal and far better than we have seen in the cases subjected to radical dissection but without removing one or both pectoral muscles.

In one case we removed the breast where the disease was not known until the patient was on the table and ready for a hysterectomy for cancer. Both uterus and annexa were removed, and then the radical operation for breast cancer was performed. The patient died of recurrence in the pelvis.

It is admitted by those in this city who use the Roentgen ray treatment that they do not propose to substitute it for proper surgical treatment. They are all inclined to think the x -ray treatment the one to be relied upon in case of recurrence, and claim a certain number of cures. We feel assured that their claims are in the main justifiable.

New Flap Method.—The desirable features to be observed in every operation for removal of the breast for cancer are: First, to remove as much of the skin as possible consistent with proper closure of the incision.

Second, to attack the deep infraclavicular and axillary regions first (Meyer), and to remove the pectorals along with the fat and suspected glands from above downwards and to avoid exposure of the cancer area.

Third, To cover the exposed surfaces with healthy skin and as far as possible to avoid undue traction.

It is our purpose to use the axillary flap by bringing it forward and upward to the infraclavicular horizontal line where the incision is first made. In this way the flap which covers the pectoral muscle is used to cover the space left by the removal of the breast. The manner of procedure is as follows:

The elbow is raised to the horizontal line as usual; the protected hand is raised and supported by a rod or post attached to the table; the forearm is in this way left in a perfectly easy position. A horizontal incision is made extending from the insertion of the pectoralis major nearly parallel to the clavicle and about two and one-half inches from it to a point below the first and second third of the clavicle. The length of this line is usually about five inches. We can, by means of this first incision alone, reach all the important vessels and clear the entire space below the clavicle and the axilla of fat and suspected glands. But the opening may be enlarged and an increased amount of room may be secured by making the beginning of the downward incision. This need not be at first more than two inches, as the space will be ample and there is no necessity for great exposure of the space between the muscle and gland which is apt to occur if we open the wound widely.*

A circular incision is now made around the breast which usually has its center at the nipple and a diameter of from four to five inches. If the induration in the gland is at the periphery of the breast the outline must include that portion and, of course, as far beyond as possible, always including the nipple. The downward incision is now completed by extending it until it meets the circular outline around the breast. We now proceed to dissect the skin from the pectoral muscle and then to remove the muscle as indicated above, taking the muscle and gland away together. The second incision which was mentioned

*This method was suggested to me by Dr. Jackson of Kansas City.

above may commence about two inches inward from the insertion of the large pectoral and is made nearly along over the vertical of the outer portion. We favor the plan adopted by the Mayos of leaving a portion of the horizontal fibres of the large muscle below the clavicle, although we know some prefer to take away the entire muscle and the periosteum over the tubercle on the humerus at the point of attachment. After the mass of muscle and gland has been removed we have only to tie the vessels and proceed at once to adjust the flaps, and there is no necessity for much exposure of the raw surfaces, which in this operation are perhaps greater in extent than any made for surgical purposes. Drainage is best secured by a combination of rubber tube and gauze wick. In every case there will be need of some liberation of the skin from points where there is excessive traction. We find this is imperative in every case and especially over the first incision and about the angle nearest the neck. Very little fitting or trimming of the flaps will be found necessary and this need not be described. The auxiliary flap is now brought upward and forward and secured to the infraclavicular flap, and the upper, or pectoral flap is brought downward to cover the space left by taking away the breast. The result is a line much like the letter "S". Its advantages are mainly to furnish additional skin covering, to permit greater ease in dissection of the axilla, and to leave no scar tissue under the arm.

TYPHOID FEVER IN PREGNANCY.*

BY

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TYPHOID fever in pregnancy is a subject of twofold interest, as it affects the welfare of the mother and that of the fetus. This disease is especially bad in cases of pregnancy, as abortion or premature labor occurs in the majority of such patients. Unfortunately, the literature relating to the behavior of pregnancy in different stages of typhoid fever is meager, and it throws little or no light on the points which appeal to us most strongly when confronted with a case of typhoid fever during any month of gestation. Osler says: "The disease is rare in

*Read before the Washington Obstetrical and Gynecological Society, November 3, 1905.

pregnant women; only one case occurred in our 685 cases." In the reports of Guy's Hospital, during a period of 28 years, only 7 cases are noted.

The history of this disease in pregnancy shows that the patient usually aborts or premature labor takes place. Guy's Hospital reports give 85 per cent. of abortions; Vinay gives 66 $\frac{2}{3}$ per cent. of abortions; Martinets had 66 abortions in 109 cases; Penot 56 per cent. of abortions; Sacquin has collected 310 cases with 199 abortions.

As to the ultimate effect on the mother, there seems to be a variance of opinion. Reports of Guy's Hospital show a mortality of one in the seven cases cited. Briegar reports a mortality of 19 cases in 91. Vinay had 17 per cent. of deaths in 183 cases. Sidney Boyd, obstetric physician to Charing Cross Hospital, in a report of "a case of typhoid fever in ninth month of pregnancy, with birth of healthy child," states his belief that pregnancy does not tend to influence unfavorably the course of typhoid fever.

According to Hare, Touvenaint reports a case of premature birth at the end of the seventh month, the child surviving and the mother dying.

The death of the fetus may be due to the adynamic condition of the mother without infection of the fetus, or the latter may become infected with the typhoid disease through the blood of the mother and succumb to the ravages of the infection.

If the infection is more fatal to pregnant women, it would seem that it is due to the absorption of toxins of a retained dead fetus, or to the added ills of abortion in a woman already suffering from a grave disease. The question as to whether and how the fetus is infected with the typhoid germ has been much studied of late. The literature on the subject shows that typhoid bacilli have been found in the fetal blood. This being the case, it would seem highly probable that they had previously circulated in the blood of the mother. The reports in this character of cases, when the bacilli were discovered in the fetus, show that delivery has taken place during the late stages of the fever. In cases of maternal typhoid fever, in which no bacilli were found in the fetus, abortion or delivery took place during the early stages of the fever. From the foregoing we are justified in concluding that the length of time that the fever has existed would be an important factor in determining the infection of the fetus.

The question whether a fetus can present the Widal reaction when no bacilli are found in the blood has been discussed. If this is so, it would seem to indicate that the fetus obtains its power to give the agglutinative reaction through the placenta directly from the blood of the mother, or that the fetus produces its own agglutinins in response to a stimulus from the maternal toxins. Boyd takes the position that the reason that typhoid fever is less fatal to the fetus in the late months of pregnancy is that the epithelium of the chorionic villi may act as a barrier against the passage of organisms from the maternal to the fetal blood.

Fordyce, Widal, Abert, Freund, Siglio, Ernst and others, have reported cases of infection of the fetus in utero, and it is believed that when an infant does not become infected, this is probably due to the action as a germ-filter of an entirely intact syncytial layer. Williams contends that the reason some feti are infected is that some injury to the placenta exists prior to the disease or results from toxins produced by bacteria circulating in the intervillous spaces.

A fetus having passed through an attack of typhoid fever in utero, and being born alive, may present injuries which may or may not be permanent. Dana notes a case of a young woman suffering from impaired speech and hemiparesis as a result of a severe typhoid infection in her mother before her birth.

The treatment of typhoid fever in pregnancy is not different from that of the disease in the unimpregnated, except insofar as the disease is modified by the presence of the fetus in the uterus. The questions arise, whether it is ever justifiable to perform an abortion unless there is positive evidence that the fetus is dead, and whether, if the fetus is viable during the latter months of pregnancy and the mother very ill, we may hope that the fetus has been protected by the syncytial membrane, and can deliver with the hope of saving the child.

Some physicians seem to be of the opinion that typhoid fever in pregnancy being a dangerous condition, abortion should be performed as soon as a diagnosis of fever is made, thus converting the disease into one of typhoid fever uncomplicated, at least, by pregnancy. A little more than half of the children are lost, about 56 per cent., but 44 per cent. are saved, and unless the induced abortion gives the mother a much larger chance of recovery the pregnancy should certainly not be interrupted. The question then is, does pregnancy materially

affect the maternal mortality and, if so, to what extent? In Sydney Boyd's opinion the impregnated woman has as favorable a chance of recovery as the unimpregnated. The mortality in the impregnated women is placed at between 14.3 per cent. and 20 per cent. The mortality in the unimpregnated is, in hospital practice, from 7 to 20 per cent.; in the United States Army for the ten years preceding 1896, 19.27 per cent.

The Brandt method of treatment, it is true, has lowered the mortality, but according to Osler the cold-bath treatment is not only not contraindicated, but is most efficacious in typhoid fever in pregnancy, and may we not hope with more cases reported to find the impregnated woman has nearly as good a chance for her life as her unimpregnated sister suffering with typhoid fever?

The question of delivering a fetus to save it from developing the disease late in pregnancy should be decided on the merits of the individual case; surely it will not be done very often.

I saw, in consultation, last summer, two cases of typhoid fever in pregnancy. One patient lost her life and did not miscarry; the other is well and is not yet delivered. Case I I saw with Dr. Dorsey. Mrs. H., white, married, aged 27 years, housewife, about five months pregnant, was taken sick July 4. Temperature was high from the start and patient seemed very ill. She was admitted to the Sibley Hospital July 18, with bed sores. Temperature was then 104.5° F. Patient was delirious and picked at the bedclothes, had involuntary movements of the bowels and involuntary urine action. I saw her about July 28; she was very ill, abdomen very much distended; temperature 103.2° F., pulse 140, respiration 40. I was called to perform an abortion, but seeing no evidence of death of the fetus, declined to do so, as I thought the operation on so ill a woman would be fatal. The patient died August 3, probably of exhaustion.

The fetus not having been expelled, no cultures were made, and whether it was infected with the disease is impossible to say, but the mother presented a typical case of typhoid fever, and I did not see that the pregnancy complicated it at all.

Case II was attended by Dr. Webb. Mrs. B., white, married, aged 24 years, housewife, was admitted to the Sibley Hospital September 1, about five months pregnant, temperature 104, pulse 110.

This patient was not nearly so ill as the first, and the tem-

perature responded promptly to baths. The temperature beginning to get high about September 10, I was called to consider the propriety of an abortion. I saw no reason for this procedure and the patient is now well with prospects of a healthy living child, she being now in the eighth month of pregnancy

1312 FIFTEENTH STREET.

ASSOCIATED NERVOUS CONDITIONS IN GYNECOLOGY WITH ESPECIAL REFERENCE TO THE CLIMACTERIUM AND ALLIED STATES.

BY

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(Concluded from page 326.)

The Climacterium.—Many patients with nervous symptoms come into the hands of the gynecologist at that period of the patient's life which closely approximates the time of the normal menopause or climacterium. Many of these patients are ceasing to menstruate, either gradually or suddenly, and attention is naturally directed to the possible arrival of the critical period, known to the laity as the "change of life." When, however, patients of this kind are still menstruating, or are menstruating more profusely than usual, this possibility is not sufficiently considered. On the other hand, this is the period of life in which various conditions are prone to produce not so much hysterical as neurasthenic symptoms. In many instances the symptoms are not those of the supposedly typical climacterium, and for that reason a differential diagnosis is rarely attempted. It seems to me that we find at this period of life two classes of cases: (1) Cases which may be considered as excitable, and (2) cases which may be considered as melancholic or depressed. The excitable class conform more closely perhaps to the usual picture associated with the change of life. It must be noted that after castration, too, the same division into two classes is observed: (1) the excitable, and (2) the depressed. In not all instances are the vasomotor symptoms present, nor are palpitation and irritability always observed. It is certainly easy in the form associated with depression to make the diagnosis

of neurasthenia or nervous prostration. Although at this period of life, and perhaps more so than at others, neurasthenia does occur, nevertheless, many of these cases are probably such as are produced by a failure in the ovarian function. It has been noted by many observers that after castration those cases which have regular or irregular bleedings, suffer less from the artificial climacterium than those in whom the bleedings cease at once. The same observation is made in cases of the natural menopause. This is not always so, yet it may be taken as a fair general rule. I have observed in patients in whom I have diagnosed the climacterium, and who still menstruated normally or profusely, that in the intervals between the bleedings the various nervous symptoms grew worse. This observation applies especially to the excitable forms. When the next menstrual or irregular bleedings occurred, the nervous symptoms diminished and then gradually began to grow worse up to the time of the next uterine flow.

According to Fehling the evidences which accompany a natural menopause are congestions, flushes, sweatings, which have a tendency to disappear after one-half to one year; they sometimes last for years. There may be superimposed palpitation, dizziness, nervous symptoms of the stomach and intestines, a feeling of flatulence and distention, neuralgias, especially costal, sleeplessness, an anxious feeling, mental unrest, irritability. Depression and melancholia are seldom found. (Cases, IX, X, XXI.)

It is important again to mention the fact that menopause is generally considered an essential evidence of the climacterium. This is not so. One of the important complications of the climacterium are great uterine bleedings, regular or irregular in their occurrence. With these bleedings the essential constitutional and nervous symptoms of the climacterium may be present, even if not in full force. Because of the presence of the bleedings, the fact that climacteric symptoms may nevertheless be present is generally overlooked, so strong is the idea that only a cessation of the menstruation is proof of the onset of the climacterium. (Case IX.)

According to Martin, the symptoms after castration are rushes of blood to the head, combined with a feeling of anxiety. There is often added thereto palpitation, dizziness, tinnitus, sweating. These symptoms occur in various combinations, often repeated several times a day. Continuations of these

conditions lead to feelings of weakness, to headaches, sleeplessness, etc. The symptoms usually improve after two or three years, but sometimes continue for five or six years. These states result from absence of the ovarian secretion. (Cases XII, XIII, XIV, XVII, XX.)

It is generally considered that after hysterectomy the annoying symptoms of the climacterium are absent if the ovaries be left behind. This view is an erroneous one. The ovaries gradually atrophy, and their functions disappear at various periods, generally at the end of the second or third year. Then the climacteric annoyances come on, as a rule in slighter degree than is the case when the ovaries are removed together with the uterus.

When in hysterectomy the ovaries are left behind, it is found that within two or three years they atrophy. The relation of the ovaries to preparation of the uterus for pregnancy is certainly their main purpose. When the uterus is removed and menstruation ceases, the ovaries in the course of time (for what exact reason we cannot determine), atrophy. In such patients, after the lapse of a certain period, the usual climacteric symptoms appear, but in slighter degree. Here, too, we have evidence of the results of ovarian insufficiency, and absence of the ovarian secretion.

In the light of our present knowledge we know that, aside from furnishing the ovum, the ovary possesses an internal secretion. This internal secretion produces various normal manifestations in the pelvic region, and in the body general. We know that the ovary is essential to a proper preservation of the female genitalia; most particularly is it essential to a proper preparation of these structures for pregnancy. We believe likewise that the ovaries are related to pathological conditions associated with pregnancy, such as hydatid mole and chorio-epithelioma. We know, further, that the ovaries stand in relation to those sclerotic and atrophic changes in the uterus which produce climacteric bleedings. Aside from this, preservation of the ovaries may have a bearing on other physical and mental conditions of the patient, as can be recognized by the changes which occur when the ovaries gradually atrophy at menopause, or by the change occurring when the ovaries are removed by operation.

That the ovarian secretion is not of essential importance, is evidenced by the fact that a goodly proportion of women

go through the menopause without noticeable annoyances, and that a fair proportion of the operative cases have little or no annoyance at all. The same variations in degree, in intensity, and in the duration of symptoms as are observed in the natural climacterium, are to be likewise observed after surgical castration. The disturbances after operation are at first mainly of a vasomotor nature, and are accompanied by psychic unrest. Why do these disturbances occur? Is it because the ovarian secretion furnishes something which is actively necessary, or is it because the ovarian secretion nullifies some other substance produced in the body? During the natural climacterium the annoying symptoms are generally worse in those patients in whom atrophic changes in the uterus occur rapidly, while they are less annoying if these changes go on slowly. The patients who have irregular and profuse bleedings, often, but not always, suffer less from the annoying constitutional and nervous symptoms. It seems as if, with the loss of blood, there is expelled from the body a toxic substance which, when retained, produces the phenomena of which we are speaking. After menopause the system gradually becomes accustomed to this condition of retention, or else the retained injurious products are no longer produced and the annoying evidences gradually disappear. After surgical castration, even in the severe cases, the body eventually becomes accustomed to the absence of the ovarian secretion; yet many cases have few or no symptoms at all, which fact shows that the same variations are observed in the menopause after castration as are noted in the menopause occurring along normal lines.

Glaevecke says that castration develops an artificial climacterium, which in all points resembles the natural, and the female enters through the castration prematurely into the climacteric age. "Castration cuts deeper into the general organism of the female than does total extirpation, and we must rate the mutilating effect of the first higher than the latter. Very noticeable were the changes in the mental sphere, where we generally saw a depression of temperament, which often increased to marked melancholia, and in three cases went on to a real psychosis."

On the other hand, Pfister claims that "the so-called mutilation (of castration) should not be rated so high, in that the influence which the female ovary exerts on the female organism is much overrated."

Alterthum, too, says: "The complete removal of the ovaries does not at all produce the injurious results upon the mental and physical condition of the female that have generally been accepted."

Abel says, that "after removal of the uterus, the ovaries enter into a more or less rapid atrophy, which causes, before the age limit of the natural climacterium, a complete disappearance of ovarian function. It is certain that after removal of the ovaries, we see *at once* all the physiological accompaniments and anatomical consequences of the climacterium developing in a relatively short time, more immediately and sharper than they generally take place at the natural age limit. Not so after the removal of the uterus. Here the transition is more natural and milder."

Leaving out of consideration the varying and diametrically opposed views as to the value of preservation of the ovaries, especially in operations which render pregnancy no longer possible, let us again consider the symptoms which occur when the ovaries gradually atrophy or are suddenly removed.

The symptoms which occur in either of these instances are mainly the following: (1) Flushes, with or without reddening of the skin, frequently followed by a sensation of cold and sweating; (2) palpitation of the heart; (3) dizziness; (4) headaches; (5) sleeplessness; (6) disturbances of digestion; (7) irritability of temper; (8) tendency to either mental depression or excitement; (9) various "nervous" manifestations, especially psychical unrest; (10) psychic disturbances. A comparison of all these symptoms with those which I have selected as "hysterical symptoms," or as "neurasthenic symptoms," and with the symptoms of aberrant Basedow's disease, shows a marked resemblance, more than sufficient to prove the frequent possibility of error and the *need of an exact differential diagnosis, especially in cases about the climacteric age.*

Fehling says: "The symptoms are worse if the senile uterine changes are marked and sudden; they are less if the senile uterine changes come on slowly. Psychical disease is seldom noted. *The symptoms are worse in women formerly neurasthenic or hysterical.*"

According to Baruch and others, the annoyances after castration are most marked in nervous and hysterical women. They find it hard to distinguish in such patients between the "nervous symptoms" and those which are due to the meno-

pause. That is the difficult question. Are the severe nervous annoyances at the menopause due to the absence of ovarin, and to the consequent metabolic changes, in predisposed individuals only; or are they due entirely, directly and specifically to the menopause or the climacterium itself without regard to predisposition? It can certainly be said that we often enough see severe climacteric annoyances in women who, before this stage, showed absolutely no characteristics which could be considered as nervous. On the other hand, we see quite often no bad results at all after castration in patients who before operation were certainly nervous, nervous even years before the condition for which they were operated existed. In fact, we often see such patients very much improved after operation. (Case XV.) These various factors speak for the specific causation of climacteric symptoms.

The symptoms caused at the climacterium, artificial or natural, are certainly due to diminution or absence of function on the part of the ovary, as is proved also by the good results obtained by treatment with ovarin.

Mainzer, in the clinic of Landau, found that disturbances in the vasomotor system, resulting after castration, disappear upon the administration of ovarin; that disturbances after the natural climacterium are benefited; that the results in primary or secondary amenorrhea are satisfactory, but that no effect is exerted upon general hysteria. (Cases X, XII, XIII, XIV, XVII, XIX, XX, XXI, XXII, XXIII, XXIV.)

In the study of the symptoms of the climacterium, either natural or artificial, I have long been accustomed to consider these cases as instances of what I have termed "Relative Basedow's Disease," because the symptoms resembled, to a considerable degree, the symptoms of Basedow's disease. The more important reason was the fact that I considered the symptoms of the climacteric cases to be due to relative hyperthyroidism. Since Basedow's disease was considered to be due to hypersecretion of the thyroid, the term "Relative Basedow's Disease" seemed an apt one.

According to Welles the close relation between the thyroid and the reproductive functions is beyond question. The points in favor of these are the following: (1) The greater size of the thyroid in females; (2) the enlargement of the thyroid in menstruation and pregnancy; (3) the tendency to develop goiter during pregnancy; (4) early atrophy of the thyroid after the meno-

pause; (5) loss of sexual appetite in many of the thyroid diseases; (6) 80 per cent. of all goiters, 80 per cent. of myxedemas and most cases of Graves' disease occur in the female; (7) Halsted observes that bitches, who had lost part of their thyroids, when impregnated showed evidences of athyreosis as the time of parturition approached, which disappeared soon after the litter was born; (8) all of the pups of these litters had thyroids many times the normal size; (9) "even in dogs, if they are old, thyroidectomy is neither fatal nor accompanied by the usual symptoms. Kocher points out that postoperative myxedema scarcely occurs at all in elderly people." (Thomson.)

The ovarian secretion has the effect of producing a congestion in the genital region. Thyroid secretion has a tendency to produce anemia in this region, and even without absolute proof of this fact, I have considered these two secretions to be antagonistic in their action. When the ovaries are removed at operation, the vasomotor and other disturbances which come on resemble more the symptoms of hyperthyroidism than any other condition of which we have any knowledge. In women who have not been operated on, in women at menopause or climacterium, and even in women who are not near the menopause age, we frequently see annoyances of the same nature, often combined with scanty menstruation and with the other evidences of ovarian insufficiency. Are we not justified in considering the relative over-secretion of the thyroid in them, too, as the pathological basis?

For instance, Osler considered the typical symptoms of Basedow's disease to be tachycardia, exophthalmos, goiter, and tremor; "which is of great importance in the diagnosis of early cases." Among the other symptoms mentioned by Osler, are anemia, emaciation, slight fever, vomiting, diarrhea, pruritus, irritability of temper, change in disposition, great mental depression, weakness of muscles, especially a "giving way" of the legs. According to Osler thyroid extract given in excess produces symptoms not unlike those of Basedow's disease, viz., tachycardia, tremor, headache, sweating, disturbances of menstruation, etc. The use of thyroid extract, he says, usually aggravates the symptoms of exophthalmic goiter. According to Gideon Welles, thyroid administered in large amounts produces the following symptoms: palpitation of the heart, headache, nausea, vomiting (if the dose is excessive), excitability, irritability, sleeplessness, diarrhea often. Moebius says that "Base-

dow's disease is an affection of the body through morbid activity of the thyroid gland."

The following theories, among others, are mentioned by MacCallum as possible explanations of Basedow's disease: "(1) A general neurosis. Constant changes in the thyroid, however, cannot be explained on this basis. (2) Mœbius' theory of hyperthyroidization. However, not *all* symptoms can be caused by injecting thyroid extract into animals. Histologically we cannot say that the gland is secreting actively. Results of operation are not uniformly good. A combination of exophthalmic goiter with myxedema speaks against the exclusive rôle of the thyroid. (3) Lesions of the sympatheticus. This explains only haltingly a few of the symptoms. (4) Parathyroid inactivity, or insufficiency. Disturbance of the thyroid secretion causes myxedema. Disturbance of the parathyroid causes exophthalmic symptoms. This might explain combinations of these conditions. This latter theory seems to offer some promise." On the other hand, it is the opinion of Thomson that intestinal intoxication is the probable cause of this disease. In his opinion the points which disprove that the thyroid is the cause are: (1) Simple goiters cause no symptoms: (2) Graves' disease often occurs without goiter. (3) The severity of the toxemia in Graves' disease bears no relation to the degree of thyroid hypertrophy. (4) Even though myxedema and Graves' disease do form an absolute contrast, yet we have no other known example of specific disease due to hypersecretion on the part of any gland. (5) The administration of thyroid causes giddiness, cardiac palpitation and moderate and temporary tachycardia, but not in the important and characteristic symptoms of Graves' disease. (6) The frequency in women. He explains this "by the proneness of women to gastrointestinal derangement in connection with menstruation, pregnancy and menopause." (7) Treatments based on the theory of gastrointestinal origin of the disease are so superior that they confirm the idea that diet and digestion and disorders connected therewith are the chief factors in the etiology.

"Whether, therefore, the constitutional symptoms of Graves' disease be due to excess of thyroid secretion or to atrophy of the parathyroids (with deficiency of their secretion) or to a toxemia of gastrointestinal origin, the empirical fact remains that resection of one-half or more of the hypertrophied gland substance has been followed in numerous instances, on the

testimony of competent observers, by amelioration of the constitutional symptoms, amounting, it is claimed, to a supposed cure of the disease itself in the majority of those operated upon, and in other cases to undoubted improvement, with comparatively small percentage of failures." (Thomson.)

Thomson explains this by the fact that the thyroid hypertrophy, being secondary to a gastrointestinal toxæmia, is an injurious added factor, just as is an enlarged spleen in other diseases. He claims that good results are obtained by operation in cases in which he does not consider extremely severe; that many cases are considered cured which have symptoms remaining which would in his opinion only justify the claim of improvement and not of cure. He further asserts that the cases are not observed long enough, since a temporary spontaneous improvement occurs often enough in many cases. He considers that surgeons find the very severe cases prohibitory to operation.

He believes that removal of the thyroid causes myxedema but that the removal of the parathyroids causes an acute intoxication with nervous symptoms. The parathyroids neutralize a virulent poison which reaches the nervous system through the blood. "This poison is probably of food origin. The muscular tremor and the weakness are rather due to deficiency of parathyroids than to too much. The thyroid is an organ which like the spleen seems to be very susceptible to toxic agents acting upon it through the circulation. Even in dogs, if they are old, thyroidectomy is neither fatal nor accompanied by the usual symptoms." "Kocher points out that post-operative myxedema scarcely occurs at all in elderly people."

It is certainly remarkable that the great majority of cases of well-defined or aberrant Basedow's disease are observed in women. To say that an affection of the ovaries is in a degree responsible for the genuine cases, would be going rather far. The least that we can say, however, is that women are extremely prone to Morbus Basedowi, probably so because they possess ovaries.

Even if an affection of the parathyroids is an essential element in typical Basedow's disease, even if an enlarged thyroid is not the cause of the exophthalmos or of the persistent tachycardia, and even if the enlargement of the thyroid is a secondary manifestation, we are not in a position to say that an associated hypersecretion of the thyroid is not responsible for many symptoms or for cases of "Basedow's disease" without exophthalmos

and without goiter and without tachycardia. If the ovarian secretion stands in relation to thyroid activity, as seems evident from the symptoms occurring in the climacterium and after castration, there is no reason why disturbances of function on the part of the ovaries may not be responsible for these forms of "relative hyperthyroidism" and "relative Basedow's."

Thomson says, "The theory of the thyroid origin of Graves' disease affords no explanation of the greater liability of women to the complaint. In my list of the patients with goiter there are 36 women to 6 men, and of those without goiter, 24 women to 4 men, a ratio in keeping with other statistics of this disease. It is difficult to imagine why the thyroid itself should so differ between the sexes as to account for the preponderance of women, but it is quite otherwise when we take into account the proneness of women to gastrointestinal derangement in connection with menstruation, pregnancy and the menopause. *In each of these conditions digestive disorders frequently occur, with nervous accompaniments not unlike in nature to the incipient symptoms of Graves' disease.* In pregnancy a slight enlargement of the thyroid is very common, but equally so are the digestive derangements."

Thomson explains the frequency of Graves' disease in women "by the proneness of women to gastrointestinal derangement in connection with menstruation and pregnancy and menopause." In our opinion it is just at these three stages that ovarian inactivity or insufficiency and ovarian relation to the thyroid would produce the annoying combinations of nervous symptoms, easily mistaken for hysteria or neurasthenia and resembling or actually producing aberrant forms of Basedow's disease. Even if Thomson is correct in his statement we must still reason out what makes women prone to gastrointestinal disturbances in connection with menstruation, pregnancy and menopause. May not this proneness to gastrointestinal disturbance be the result of the metabolic changes which occur at menstruation, pregnancy and menopause, and if they are the result of the metabolic changes, then what more rational idea have we than that ovarian and thyroid interrelation, naturally of fluctuating than of a stable character, produces through hyperthyroidism not alone annoying and nervous symptoms but innumerable variations in the severity of the symptoms. If parathyroid diminution were found to be the essential factor in Basedow's disease and in aberrant Basedow's disease, we

might still reasonably believe that the ovaries played a part in the way of relation of secretions.

Perhaps in the climacterium the annoying nervous symptoms are less if the thyroid atrophies coincidently with the ovaries, and perhaps the symptoms are more annoying if the thyroid atrophies more slowly than the ovaries.

Perhaps in the climacterium the excitable cases are those with too much thyroid, and the melancholy ones with too little.

Perhaps, after operation, the thyroid atrophies on absence of the ovaries, quickly in some cases and slowly in others, as probably happens at the normal climacterium. The patients grow stout, probably because the ovaries and later the thyroid, are gone, and oxygen exchange is diminished; in some cases, possibly because the thyroid secretion being diminished or non-functionating, there is a "relative myxedema."

The probabilities are, that ovarian insufficiency in many cases means relative hyperthyroidism. At any rate, even if the theory of relative hyperthyroidism is not correct, the fact that many of these conditions are related to ovarian insufficiency is certainly not to be questioned. The least that we can say is, that the symptoms resulting from diminution or absence of ovarian secretion, and the symptoms of hyperthyroidism are sufficiently alike to express the opinion that they are one and the same.

It is of interest to follow the action of thyroid extract, particularly in the cases who have lost both ovaries at operation. Among such cases there are those who suffer absolutely nothing annoying after the castration. There are others who suffer in a mild degree, and others in a very marked degree. In administering thyroid extract to some of these cases, I have observed that in the first class there are produced some flushes and some irritability, but no marked results. In the second and third class of cases, each and everyone of the annoying symptoms is markedly increased. So noticeable is the sensitiveness to thyroid, and so marked is the increased severity of the symptoms, that one can scarcely doubt that hyperthyroidism is the cause of the symptoms in the first instance. (Cases XVII, XX, XXIII, XXIV, XXIVa.)

On the other hand, the moment the thyroid extract is stopped and the patients are again put on ovarin, the annoying symptoms cease and almost entirely disappear. I have admin-

istered ovarin and followed its action in over twenty-five cases of double-oophorectomy, with or without loss of the uterus, and have never failed to observe an almost entire absence or disappearance of annoyances, especially if the ovarin was administered soon after the operation. On the other hand, I have not been able to secure the same brilliant results by the administration of ovarin in cases of natural menopause or climacterium, as have been published by other authorities. Yet I have seen enough of its beneficial, though slower effects, to feel satisfied of its specific action.

After castration, the reduction of oxygen exchange amounts to 20 per cent.; the general gas exchange being likewise diminished; the weight, as a rule, increasing. The effect of ovarin, if given within two or three months after castration, not only overcomes this change, but increases the gas exchange above the normal, this increase lasting a variable time, and diminishing gradually. On normal animals no effect is observed. The use of preparations obtained from the male organs exerts no effect on the female deprived of ovaries.

We must remember that ovarian extract has the effect of increasing oxydation, and perhaps of increasing the elimination of waste products, and the good results might be explained on this ground, were it not for the specific action of ovarin when administered after castration. Thyroid extract, as is known, increases oxydation and especially aids elimination, and produces marked metabolic changes. This may account for the good effects obtained by the administration of thyroid, even in certain conditions, in which one would naturally expect thyroid to act injuriously. Good results have been published very generally on the administration of thyroid in simple goiter. Many have published good results from the administration of thyroid in Basedow's disease, and, as is well known, numerous cases of obesity react beautifully to the careful administration of thyroid extract. On the other hand, several exact observers, while acknowledging the value of thyroid extract in simple goiter and obesity, have noted absolutely no beneficial influence in cases of Basedow's disease, while others state that thyroid extract almost generally increases the annoyances associated with exophthalmic goiter. The beneficial effects of thyroid extract in certain mental diseases is explained on the theory that the metabolic and other changes which it produces in the brain cause a reaction, which in some instances is

beneficial. On the other hand, as might be expected, numerous cases are uninfluenced or harmed thereby, especially if in them the element of hyperthyroidism is present. (See *Medical Record*, March 16, 1901, for action of ovarin in Basedow's disease.)

States Allied to the Climacterium.—We observe in women who are not near the climacteric age, in women who have local disturbances of various natures, and in women who have none of these disturbances, symptoms of very much the same character as are typical of the climacterium, either natural or artificial. While the flushes are not marked, yet they have palpitation, the irritability of temper, the mental depression, the psychical unrest, the dizziness, the sleeplessness, and the intestinal disturbances. It is these points which have given rise to the diagnosis of reflex neuroses, neurasthenia, hysteria, etc. It is fair to suppose that in many of these cases we may be dealing with aberrant Basedow's disease, or with ovaries which are either not producing a positive secretion that is needed, or which are not producing a proper secretion to nullify such other substances as are able to produce the symptoms that occur in climacterium, natural or artificial. A comparison of these symptoms with those of the climacterium and with the symptoms of Basedow's disease, especially of the aberrant forms, had led me to believe that they as well as the annoyances of the climacterium are due to hyperthyroidism. (Cases XVIII, XIX, XXIII, XXV, XXVI, XXVII.)

In only two of these cases was there persistent tachycardia, but in all, at various times, one or other of the cardinal symptoms have become markedly noticeable. In all of them the mental irritability, the tendency to magnify slight details, the mental unrest, the sleeplessness, palpitation, attacks of weakness, etc., have reminded me so forcibly of the symptoms of the climacterium, that I have considered four of them (Cases XXIII, XXV, XXVI, XXVII. as belonging to the group of cases of the climacterium, or climacterium præcox. From our knowledge of this condition, we may consider the etiology to be a relative degree of hyperthyroidism. To-day we are uncertain as to the relation of the thyroid secretion, or the parathyroid secretion, or both, to the variations which are found in Basedow's disease, or to those cases in which the symptoms of Basedow's disease and myxedema are coexistent. That this condition of hy-

perthyroidism may occur in patients without marked pelvic involvement, is evident from the cases cited above (cases of ovarian insufficiency or relative hyperthyroidism). If it may occur in such cases, there is more warrant for accepting a like condition when ovarian function is disturbed by pelvic disease of a circulatory or inflammatory or atrophic nature, such as cases of Freund's disease.

It would be strange if gynecologists had attributed, entirely without reason, to pelvic disturbances so many constitutional and nervous symptoms in women. It has attributed them perhaps too much to these pelvic disturbances acting through reflex channels. There is certainly a large proportion of women who suffer from so-called reflex symptoms who cannot be classed under hysteria or under neurasthenia, but in whom ovarian insufficiency or relative hyperthyroidism is probably present. It is often a difficult question, from the standpoint of diagnosis, but the predisposition of the female to various combinations of nervous symptoms certainly points to a general state as the causative factor.

The relation of the ovary to the normal function of a special character in women is decidedly clear; its relation to a pathological state is highly probable. The weaker sex, with its tendency to these affections and to hysteria, will probably in the future be less frequently treated as possessors of nerves alone. It is not probable that ovarin replaces all that the ovaries should furnish, nor can ovarin, in a short time, overcome injuries long existing; that its action in the above-mentioned affections, verifying, as it does in a measure, the results of animal experimentation, may lead to a more rational treatment of certain diseases in the female, both medically and surgically, is not to be doubted.

Among the causes of "nervous conditions" which are often enough encountered in gynecological practice, we find the following of greatest importance: (1) Diminished excretion of urea; (2) chlorosis; (3) menstruation often periodically, making all "nervous symptoms," of whatever nature, worse; (4) pregnancy, increasing nervous annoyances, or producing new symptoms, many of which are now known to be due to pregnancy and to the irritating action of placental secretion; (5) pelvic and abdominal ptoses, associated with pelvic, abdominal and constitutional subinvolution; (6) hysteria, with or without adequate local predisposing irritation; (7) neuras-

themia, with or without adequate local predisposing irritation; (8) nervousness and congenital sensitiveness of the nervous system; (9) Basedow's disease; (10) aberrant forms of Basedow's disease; (11) climacterium, with menopause; (12) climacterium, without menopause; (13) artificial climacterium, following castration; (14) artificial climacterium following hysterectomy, without castration; (15) pelvic inflammatory and congestive conditions, producing symptoms which simulate some of the symptoms of hysteria and neurasthenia—generally called "reflex neuroses;" (16) nervous symptoms, resembling the symptoms of the climacterium or menopause, to be known as climacterium præcox, or possibly "relative Basedow's disease"—probably including group 15, in all of which hyperthyroidism is to be considered.

Realizing the relation of the ovaries to many of these divisions, we may say, in the words of Virchow, "all peculiarities of the female body and mind or nutrition and nerve function, are only a dependent of the ovary."

DIMINISHED EXCRETION OF UREA.

CASE I.—Miss G.; 24 years old; menstruation q. four weeks; decided dysmenorrhea on the first day; leucorrhea; referred to me because the leucorrhea was considered a severe symptom; complains of headache, indigestion, flatulence; hands and feet feel cold, and often tingling; pains felt in various parts of the body, particularly in the back; is tired, languid; physical inertia; is subject to eczematous eruptions on the hands and face; no anemia; kidney, heart and other organs normal; urea excretion far below the normal; treated on the principle advised by W. H. Thompson; sodium phosphate every morning in hot water; tincture aconiti for two weeks; then nitroglycerine; blue mass, five grains, once a week, at night; no red meats; only selected vegetables and fruits.

There has been a gradual increase in the urea excretion, which has more than trebled. Patient feels better in every way; has lost the tingling and cold sensations in the hands and feet; has lost feeling of coldness; headaches have disappeared; languid sensation almost gone; indigestion and flatulence vastly improved. Under observation five months.

CHLOROSIS.

CASE II.—Mrs. C.; 24 years of age; married five years; o-para; suffered two years ago from a diagnosed appendicitis; since

then complains of pain in the right side and dysmenorrhea; came to me because of this condition, and because of a general weak state. Examination showed a right-sided salpingo-oophoritis. Patient complained of languor and lassitude, pain in the neck and back of the head and along the spine. Suffered from palpitation on exertion, and from dyspnea when climbing stairs; becomes readily tired; had no energy; has no appetite and is very constipated; has felt more or less like this since her marriage. Patient was plump and well nourished, but had the typical chloritic color; heart and kidneys normal, but urea excretion diminished. Blood examination showed a typical chlorosis. Diet, iron and arsenic and blue mass, brought about a complete change in eight weeks, and now feels better in every way.

THE IRRITATING ACTION OF PREGNANCY.

CASE III.—Mrs. L.; 24 years of age; o-para; now gravid six and one-half months; treated for sterility by amputation of the cervix.

Before operation: Nervous, sensitive woman, subject to indigestion, flatulence and constipation; complains of occasional headaches; of pains in various parts of the body, constantly changing in their location; always worried about the significance of the pains, and is fearful that they imply severe conditions; is annoyed by sleeplessness and attacks of fear and fright at night, when alone; is very introspective, and is constantly worrying about herself; heart and kidney and other organs normal; no anemia; urea excretion correct.

No change after operation.

After impregnation: Has nervous attacks, *i. e.* attacks of headache, pains in the eyes and teeth; burning sensation in the nose, going up into the head; feels dizzy; has pains all over; has had four such attacks within a period of three weeks, and in the last one fainted. After such attacks of "weak spells," which last one hour, she trembles markedly, and after two hours feels better. During the attacks she has marked palpitation; has had such symptoms occasionally, but very much slighter, before pregnancy; they are always preceded by indigestion and flatulence, and are independent of any mental or emotional cause. Under observation three years. This case probably belongs to same class as Case XVIII.

TYPICAL GENERAL SUBINVOLUTION.

* CASE IV.—Mrs. M.; 27 years old; 1-para; first seen when baby was one year old. Patient had a large loose pendulous abdomen. There was a large retroflexed uterus. There was hysteroptosis, and a general state of inelasticity. The patient complained of headaches, indigestion, constipation, indefinite pains in the abdomen, severe backache; sense of weight and dragging in the pelvis; a feeling of lassitude and weakness, and of general depression. Treatment: Alexander-Adams operation, abdominal belt and abdominal massage, a course of carbonated baths, general tonics and attention to the bowels. The improvement, as it always is in these cases, was marked. This case is quoted because it is typical of the innumerable instances of a like nature. The treatment of these conditions is best explained by the following quotation from the *Medical Record* of November 24, 1900.

"Those cases, called hysteroptosis, were decidedly benefited. All the patients gained in weight and strength, and the number of red blood cells was constantly increased. Appetite improved, and a feeling of strength and exhilaration resulted, such as no other treatment in my opinion, could have accomplished in the same time. At the same time, the local symptoms and, what is more important, the idea that a diseased local state existed, disappeared.

"I believe that the results obtained justify me in claiming for the carbonated saline baths a power of resorption too valuable to be underestimated, a method which, at the same time, benefits the general state to a decided degree, and which acts by increasing the natural and effective functions of the body, and in toning up those pelvic structures which depend so decidedly for their elasticity and blood supply on the condition of the body generally."

That simple descent of the uterus alone, unaccompanied by abdominal and general subinvolution, does not produce these constitutional symptoms, is only too apparent from the numerous instances of prolapse of the uterus of various degrees (some of which may be corrected by the use of the pessary [Case Vf]), where the patient suffers absolutely no nervous phenomena. It is only those cases of hysteroptosis, accompanied by pelvic congestion and lack of general elastic tone, who are properly included in this class.

PELVIC LESIONS, NOT FOLLOWED BY NERVOUS SYMPTOMS.

That local pelvic diseases of a marked nature, even when accompanied by decided pain or discomfort, are not necessarily productive of themselves, of nervous disturbances, may be seen from the following histories:

CASE Va.—Mrs. C.; 28 years of age; o-para; married nine years. One year ago, pain in the left side came on suddenly. The patient was in bed for ten days with fever, the attending physician making the diagnosis of abscess of the left ovary. Now has a dull steady pain in the same spot, which is increased when she is on her feet or walking. She complains of headaches, which are worse at menstruation. She feels somewhat tired and languid. Her left leg feels weak. She is sensitive to abdominal pressure on the left side. Bimanual examination showed a small uterus, with a fundus turned markedly to the right side, with marked parametritis dextra. The left adnexa are extremely sensitive and adherent, and there is a posterior parametritis. In spite of her pain, patient evidences no nervous phenonema worthy of note.

CASE Vb.—Mrs. MacF.; 23 years of age; married three years. Shortly after marriage had a miscarriage at the second month, and two months later had an abdominal operation. She later, in her own language, "acquired a disease from her husband," and six months afterwards had a second abdominal operation done. Seen by me six months ago, suffering marked abdominal pain. Bimanual examination showed a left-sided cystic ovary and a right-sided salpingitis. She was then operated on by me the third operation. The adhesions were broken up and everything was removed, including a small bit of ovary. In spite of the almost continuous pain which she has suffered during these two years the patient is as cheerful an individual as one could wish to see; has never shown any nervous symptoms.

CASE Vc.—Mrs. H.; 28 years of age; married eight years; o-para; began to suffer from pain on the left side six years ago; was in bed for a long time suffering from metrorrhagia, since which time her pain has been continuous; her left leg is painful and she can hardly stand on it. For weeks at a time she has such marked pain on the left side that she cannot sleep. She is easily excited and gets the blues occasionally, when some irritating action arises. Examination showed a small uterus.

very narrow cervix, left-sided salpingo-oophoritis, with adhesions, which were extremely painful on examination. In spite of thorough questioning, it was impossible to elicit any complaint due to nervous symptoms.

CASE Vd.—Mrs. S.; 26 years of age; married four years; o-para. Irregular menstruation, sometimes absent four months at a time. She suffers from backache for the last two years, pain in the left side and leg, pain in the coccyx. Was curetted two years ago, and her pain is decidedly worse since then. As a girl she was nervous, but now has no blues, no depression; but is frightened by noise and excitement; complains of no other symptoms of a nervous nature. Patient has gained thirty pounds since marriage, eats well and sleeps well. Examination showed an eroded cervix, long uterus, left-sided sensitive parametritis, and other evidences of a specific inflammation.

CASE Ve.—Mrs. F.; 32 years old; married 8 years; o-para; pain in the back; constant pain on both sides. Curetted two years ago, since which time she is worse. Examination showed a small uterus, parametritis dextra and sinistra; extremely painful on examination. She has gained thirty-five pounds since marriage, and while never free from pain, suffers very little in the way of nervousness and occasionally suffers from insomnia, due to pain.

CASE Vf.—Mrs. S.; 35 years of age; married fifteen years; 1-para, fourteen years ago. Complains for the last two years of a "bearing down," and of vulvar irritation. Examination showed a retroflexed uterus and a descent of the uterus, so that the cervix extended below the hymen. Treatment for several weeks resulted in a correction of the descent, by pessary. Patient feels dizzy occasionally; otherwise is free from all nervous annoyances.

PHYSICAL AND MENTAL ASTHENIA.

CASE VI.—Mrs. C., a highly cultured woman, 45 years of age; o-para; operated eighteen years ago for an ovarian cyst; seen two years ago because of pelvic pain and general nervous symptoms. Examination showed a small right-sided ovarian cyst. Menstruation fairly regular and occasionally profuse; no anemia. Has suffered during these many years from dizziness and periods of depression. Is irritable and readily exhausted, and very frequently is depressed; has no energy; is easily

tired by exertion, either physical or mental; does not suffer from insomnia; is not subject to attacks of anxiety; is not introspective, and complains only of occasional pains, which are due to the ovarian cyst. Her menstruation is now irregular, and sometimes very profuse. Her digestion is good; is occasionally a sufferer from constipation; this state is not new; it is her usual condition. Under observation two years.

PHYSICAL AND MENTAL ASTHENIA AT THE MENOPAUSE AGE.

CASE VII.—Mrs. B.; 44 years of age; menstruating regularly; subject to attacks of fainting after over-eating; these occurring two or three times a year. For a year these attacks have come on rather more frequently; began then to feel extremely weak and depressed; no energy and easily tired after slight exertion. Gastrointestinal annoyances marked, in the form of flatulence, nausea and constipation; has been in bed for several weeks with this lethargy of body and of mind. No flushes, no palpitation, no headaches, but is a sufferer from insomnia; while awake at night has no anxiety attacks, nor is she then nervous; does not cry; is not irritable; her whole condition is one of marked mental and physical depression. Converses well and clearly, but with effort; is not worried about herself; has a considerable degree of gastroenteroptosis, and is much benefited by an abdominal belt. For four weeks has been taking a modified Weir-Mitchell cure and is much improved; no anemia; heart and kidneys normal. In its symptomatology the case resembles one of neurasthenia. Interval between last two menstruations was seven weeks. The last menstruation was very profuse, and lasted ten days. Considering the age of the patient, the fact that at no previous times has the patient shown any tendency to such a siege, we might consider it a case of the depressed form of the climacterium. Under observation six years.

CASE OF NERVOUSNESS.

CASE VIII.—Mrs. K.; 34 years of age; married sixteen years; 1-para; eight years ago pelvic inflammation; in bed three weeks; slow convalescence; subsequently curetted twice, and then referred to me because of pelvic pain and backache, existing to an almost unbearable degree for several years. Diagnosis on examination, salpingo-oophoritis duplex and parametritis. At operation the tube of one side and one-half

of each ovary was removed. A small fibroid was removed from the anterior wall, and the uterus was ventrally fixed. As a result of the operation and subsequent treatment, has lost all physical annoyances, but suffers some pain during menstruation. Has had nervous symptoms for years; in her own language, they are as follows: "Twitching of muscles," "feels her scalp moving on her head," "cries without cause," "has to hold herself in," "blue at times without cause," "her digestion is poor, and she is often constipated;" She is a typical example of a nervous woman, certainly neither hysterical nor neurasthenic. Under observation two years. Her nervousness is not a burden to her or to her family, and does not interfere with her enjoyment of life.

NERVOUSNESS AT CLIMACTERIC AGE, ACCOMPANIED BY
PROFUSE BLEEDINGS.

CASE IX.—Mrs. L.; 46 years of age; 8-para; menstruation for the last four years extremely profuse at times, in spite of a curettage, which was followed by temporary improvement. During the past summer menstruation came every two months, but now is every four weeks. Appetite is fair; suffers from constipation and very frequent urination. Between menstrual periods has flushes in the face, is extremely nervous and irritable and is annoyed by palpitation; suffers from sleeplessness, and observes a marked tendency to periods of depression; has occasional attacks, sometimes lasting three hours, in which she lies quiet, cannot move, and feels tired and lifeless; no anemia; heart, kidneys, etc., normal. Under observation three months. Bleedings probably due to uterine arteriosclerosis or muscular degeneration, so often a characteristic of climacteric changes. Diagnosis made in general condition and "attacks." Bleedings much diminished by ergotin and stypticin.

NERVOUSNESS AT CLIMACTERIC AGE, ACCOMPANIED BY GRAD-
UAL DIMINUTION OF MENSTRUATION.

CASE X.—Mrs. A.; 44 years of age; 4-para; menstruation regular, but gradually becoming less in amount. For the last year and a half, observes occasional slight flushes; complains of pains in the back, in the legs, and a dull feeling in the head; has grown extremely irritable; cries readily; is annoyed by the slightest irritations, and is often mentally depressed;

suffers from sleeplessness; considers her whole nature to be decidedly changed, and occasionally asks if there is danger of her losing her mind; no anemia; no tachycardia; no feelings of anxiety; palpitation is noticeable during periods of excitement. Under observation three years. Diagnosis made on general condition. Benefited by ovarin and carbonated saline baths.

ARTIFICIAL CLIMACTERIUM AFTER CASTRATION, WITHOUT ANY ANNOYANCES.

CASE XI.—Mrs. J.; 33 years old; married ten years; 1-para. Double salpingo-oophorectomy in September; feels better in every way since the operation; is free from pain, suffers from no annoyances of any nature whatsoever; menstruation absent.

ARTIFICIAL CLIMACTERIUM AFTER CASTRATION, WITH SLIGHT VASOMOTOR SYMPTOMS.

CASE XII.—Mrs. B.; operated on in September for double salpingo-oophoritis. At first had some pain in the median line on urination, probably due to the ventral suspension. Had headaches before the operation; has them, but much milder, at the present time; complained of flushes of the face and the whole body coming on several times during the week; is not nervous; has much less pain; feels stronger, and has a better appetite; is taking ovarin. All symptoms gone.

ARTIFICIAL CLIMACTERIUM AFTER CASTRATION, WITH MODERATE NERVOUS SYMPTOMS.

CASE XIII.—Mrs. S.; 20 years of age; 0-para; salpingo-oophorectomy in August; three to ten times a day had attacks during which she became extremely red, and then perspired; this condition lasted five minutes; occurred at night also; was extremely irritable, little things "set her off;" felt at times "like smothered;" had several "crying spells," first laughing and then crying, occurring after some little irritation. Since taking ovarin has only a flush occasionally and nothing more. Is now entirely well.

ARTIFICIAL CLIMACTERIUM, AFTER COMPLETE HYSTERECTOMY, WITH MODERATE NERVOUS SYMPTOMS.

CASE XIV.—Mrs. K.; 32 years of age; 2-para; hysterectomy in July; symptoms began three weeks after the operation;

noticed flushes, followed by a sensation of cold and sweating over the entire body; became very red, and her heart beat rapidly at those times only. The attacks lasted five minutes and recurred eight to ten times a day; they sometimes occurred at night; suffered from sleeplessness, and when awake at night felt quite dizzy. Annoyances corrected by ovarin.

NO ANNOYING SYMPTOMS AFTER HYSTERECTOMY.

CASE XV.—Mrs. H.; 39 years of age; 1-para. A woman of energy and devotion to her daughter and her work. Subject to marked attacks of headache, lasting for several days, often occurring at the menstrual period. Extremely unhappy in her married life, being separated for some years from her husband; is of a restless nature, but not what might be called nervous. Has always had a bad habit of reiteration, repeating the same remarks and speaking of the same thing in the course of any conversation. About a year and one-half ago she began to suffer from extreme dysmenorrhea, accompanied by the loss of much blood in large clots, the birth of each clot being preceded by pains as severe as those of labor. Examination showed a fibroid of the uterus. A curetting gave temporary relief to the bleedings, but they subsequently recurred with full force, and a complete hysterectomy was done. The patient suffered slight annoyance. This was corrected by ovarin.

GROUP A.

BASEDOW'S DISEASE AT THE MENOPAUSE, WITHOUT EXOPHTHALMOS AND WITHOUT GOITER, BUT WITH TACHYCARDIA AND GENERAL SYMPTOMS.

CASE XVI.—Mrs. R.; 45 years of age; 4-para; gradual and complete cessation of menstruation; had flushes, gastrointestinal disturbances, irritability, sleeplessness, but a marked and persistent tachycardia, with an average pulse rate of 130; no exophthalmos; no goiter. Medication was devoted entirely to the gastrointestinal annoyances, following the form of flatulence, constipation and dyspepsia. Was diagnosed by me as a case of climacterium; was seen in consultation by a neurologist, who confirmed the diagnosis and also the therapy. The tachycardia persisted in spite of all treatment. The patient finally passed out of my hands and, according to subsequent report, died of some intercurrent disease.

In the light of my present knowledge, based likewise on the observations of Thomson, this was undoubtedly a case of Basedow's disease. Such a persistent, marked, continuous tachycardia is not a characteristic of the climacterium. Diagnosis made on general condition and tachycardia.

ARTIFICIAL CLIMACTERIUM AFTER COMPLETE HYSTERECTOMY,
WITH SEVERE NERVOUS SYMPTOMS AND RAPID
PULSE.

CASE XVII.—Mrs. P.; 39 years of age; 3-para; hysterectomy in July; suffers from headache, but had same before operation; suffered from flushes, followed by a feeling of cold and sweating over entire body, occurring several times an hour; she cried very easily; punished her children, which she never did before; was nervous, extremely irritable without cause; suffered from sleeplessness and palpitations; had pain in the legs; legs trembled; had pain in teeth; at irregular periods was annoyed by frequent urination; has gained in weight; had for three weeks several movements of the bowels a day, generally after eating; pulse 100. The movements are fluid in character; has observed this only since the operation. Since taking ovarin all the symptoms improved remarkably. Thyroid given for three days brought on all symptoms more sharply than ever. A return to ovarin has restored her almost to the normal, but her pulse still remains at 90. Diagnosis verified by general condition, pulse and action of thyroid.

A NERVOUS CONDITION OCCURRING IN PREGNANCY, WITH RAPID
PULSE AND GENERAL SYMPTOMS.

CASE XVIII.—Mrs. L.; 27 years old; 1-para. Now pregnant six and one-half months. During the last few weeks suffers from headache, both frontal and occipital. Her head feels stiff and not "quite right;" pain in both legs; is frequently dizzy; suffers from palpitation on excitement; sleeps poorly; is awake for long periods, and "sees stars;" has flushes of the face and over entire body; perspires freely; is irritable; cries easily; often has fits of the blues; feels tired and languid; has dull, dead feeling in the fingers; cannot sit still; "feels quite different than she used to." Pulse 120 on the 17th of December; 110 on the 21st. Patient has been under my care for years. Treated several times for chlorosis; now normal, physically, in every way. Present condition of nervousness is some-

thing entirely new, and was never present in previous pregnancy. Symptoms resemble very much those of aberrant Basedow's disease or else of hyperthyroidism. Under observation six years. Belongs under states allied to the climacterium. Diagnosis made on general condition and pulse. Hyperthyroidism.

NERVOUSNESS, WITH RAPID PULSE AND GENERAL SYMPTOMS.

CASE XIX.—Mrs. Mai; 32 years old; married seven years; 1-para; menstruation q., four weeks with pain. According to the patient's story, suffered for one and one-half years from gastralgia (probably gastric ulcer or gallstones); better since six months. In the last three months patient suffers from headaches, indigestion, constipation, pain in the back; has lost in weight in the last two years. In the last three months has gradually become nervous; suffers from palpitation of the heart; flushes of the face; cries very readily; loses her patience on the slightest irritation; has frequent fits of depression, all without adequate cause. It is all a total change in her usual condition. Pulse 90; has "attacks;" her face flushes; feels dizzy; heart palpitates; becomes anxious and cries; afterwards feels cold, trembles and is very weak. For a considerable period, attacks occurred daily and without any cause, mental or otherwise. Retroversion and badly eroded cervix found on local examination, and likewise enteroptosis. Under observation four months. Diagnosis made on general condition, "attacks" and pulse. Decidedly benefited by ovarin.

ACTION OF THYROID AFTER CASTRATION, PRODUCING TACHYCARDIA AND GENERAL SYMPTOMS.

CASE XX.—Mrs. W.; 29 years of age; double oophorectomy fifteen months ago. A few weeks after the operation complained of flushes and palpitation of the heart; relieved by ovarin, which was continued for six weeks, since which time no annoyances have recurred. A year after the operation, was given thyroid, experimentally, for four days. She then complained of flushes, palpitation of the heart every half hour; she felt weak and short of breath, and "felt smothered about the heart." Complained of headache; sensitiveness along the spine, and "felt tired in her abdomen." Her pulse ranged between 100 and 110. Complained of frequent urination. Patient was put on ovarin,

and in five days all the symptoms disappeared and she felt better in every way.

NERVOUSNESS AT CLIMACTERIC AGE, WITH RAPID PULSE AND GENERAL SYMPTOMS.

CASE XXI.—Mrs. K.; 47 years of age; 4-para; menstruation regular. For the last twelve years suffers from fainting attacks, which have occurred even when in bed. These attacks are preceded by a sensation of nausea. If she lifts her left arm rapidly the fainting attacks are readily brought on. She becomes extremely nervous before each menstruation; suffers from headaches, pain in the neck and back of head, and “sees fire-balls” in both of her eyes; pains in the back; pains over the sciatic nerve; pains over the abdomen and back; palpitation on exertion, and cries without reason. Two years ago patient had what she calls a nervous collapse; was in bed for six months, during which time, in her own language, “she was indifferent to everything.” Now suffers from pain in the region of the heart on exertion; her mood changes several times a day; is exceedingly irritable; cries readily; urea excretion normal; enteroptosis; no anesthesia; no hyperesthesia; large radial pulse; uterus hard, small and retroverted; no anemia; pulse 90 to 100, and always so. Under observation three months. Diagnosis made on general condition, “attacks,” pulse. Much benefited by ovarin and hydrotherapy.

GROUP B.

BASEDOW'S DISEASE WITHOUT TACHYCARDIA, BUT WITH EXOPHTHALMOS, GOITER AND GENERAL SYMPTOMS.

CASE XXII.—Mrs. E. D.; 26 years old; married seven years; 1-para. Goiter first noted five and one-half years ago. Her eyes shortly afterward became prominent and were more so at her menstrual periods; suffered from palpitation on exertion, or when she became nervous. Demonstrated by me as a case of relative Basedow's disease, in spite of the absence of the tachycardia. Had tremor in talking. Operated in July for salpingo-oophoritis, one tube and ovary being removed. For three days following the anesthesia, her face was remarkably flushed; her eyes protruded decidedly; her goiter was enlarged; her pulse was decidedly and persistently rapid, and her heartbeat was most violent. Her symptoms then subsided. She now has

pulse of 90; observes flushes over her entire body; has palpitation on excitement, or when slightly frightened, or when in a hurry; then feels cold and perspires. After the flushes, she is nervous and blue, especially when alone, and has been that way for five and one-half years. Has lost in weight, and menstruates regularly. The operation has removed her backache, her headache, and the sense of "bearing down." The diagnosis was salpingo-oophoritis, and relative Basedow's disease.

This patient who evidenced, subsequent to the operation, the typical symptoms of Morbus Basedowi, observes palpitation only on excitement or exertion. The symptoms on which the former diagnosis was made were the peculiar form of nervousness, tremor in talking, and the exophthalmos. Under observation one year. At that time no goiter was noted. Diagnosis made on general condition, goiter, exophthalmos and symptoms after operation. This is a case in which some of the symptoms are present, just as there are cases in which the tachycardia may be present without exophthalmos, or without goiter or even without either. Is greatly benefited by ovarin. Is made typically worse by thyroid.

ABERRANT BASEDOW'S DISEASE, WITH GOITER, WITHOUT TACHYCARDIA, BUT WITH GENERAL SYMPTOMS.

CASE XXIII.—Mrs. H.; 27 years of age; o-para; complained of constant pain in the right side; menstruation slight; hypoplasia uteri; salpingo-oophoritis dextra; considered by her physicians and family to be hysterical. Has been treated by several gynecologists for pain and sterility, and has been twice curetted. Patient has a tendency to obesity; she has attacks in which she is extremely weak; has rapid pulse; marked diarrhea, the latter often persisting, after the attacks are over, for days and weeks. Her legs are then shaky and weak, and fail to support her when walking. She often stumbles without warning, because her legs "give way." Is somewhat irritable; has no hysterical stigmata; has pains occasionally in her fingers and toes. There is no exophthalmos, but a slight amount of goiter, which is always noticeable during the attacks.

Influenced by the goiter, the previous attacks of diarrhea and the shaky feeling in the legs, patient was given thyroid for diagnostic purposes. It brought on one of the typical attacks, with marked diarrhea, trembling and

irregular pulse. Thyroid was stopped and ovarin and bromides were given, and she has had no such attack since. Local treatment and carbonated baths have brought patient into excellent condition. I consider this case an undoubted instance of "aberrant Basedow's," a relative hyperthyroidism. Under observation seven months. Diagnosis made on general condition, goiter, attacks of diarrhea and shaking of legs and action of thyroid.

ARTIFICIAL CLIMACTERIUM AFTER CASTRATION, WITH MODERATE
NERVOUS SYMPTOMS (MADE WORSE BY THYROID),
WITHOUT TACHYCARDIA, BUT WITH GENERAL
SYMPTOMS.

CASE XXIV.—Mrs. S.; 20 years of age; o-para; salpingo-oophorectomy in August; three to ten times a day had attacks during which she became extremely red and then perspired; this condition lasted five minutes; occurred at night also; was extremely irritable; little things "set her off;" felt at times "like smothered;" has had several "crying spells," first laughing and then crying, occurring after some little irritation. Since taking ovarin has only a flush occasionally and nothing more. Is now entirely well.

Artificial Climacterium, with Moderate Symptoms.—Mrs. S.; double salpingo-oophorectomy. Complained after the operation of flushes, irritability, nervousness and sleeplessness, all of which were overcome by ovarin. Was given, on two different occasions, thyroid for three days. Each time the irritability, the "smothered feeling," and the palpitation recurred, only to disappear on the substitution of ovarin.

ARTIFICIAL CLIMACTERIUM AFTER CASTRATION, WITH SLIGHT
VASOMOTOR SYMPTOMS (MADE WORSE BY THYROID),
WITHOUT TACHYCARDIA, BUT WITH
GENERAL SYMPTOMS.

CASE XXIVa.—Mrs. B.; operated on in September, for double salpingo-oophoritis. At first had some pain in the median line on urination, probably due to the ventral suspension. Has had headaches before the operation; has them, but much milder, at the present time. Complained of flushes of the face and the whole body, coming on several times during the week; is not nervous, has much less pain, feels stronger, and has a better appetite; is taking ovarin; all symptoms gone.

Action of Thyroid After Castration.—Mrs. B.; double-oophorectomy; suffered from flushes and some nervousness after the operation. On two occasions thyroid was given for three days. It brought on a slight return of the flushes, a marked state of nervousness, irritability, headache and general lassitude. A return to ovarin promptly removed the annoying symptoms.

EXOPHTHALMOS WITHOUT TACHYCARDIA, BUT WITH
GENERAL SYMPTOMS.

CASE XXV.—Mrs. G.; 34 years of age; 1-para; menstruation rather profuse and always weakened by it. Examination showed hysteroptosis and marked retroflexion. Patient felt that her retroflexion, for which she had been treated, was responsible for many of her symptoms. Has suffered since the birth of her only child from general weakness, flatulence, disturbances of digestion and constipation. Has been for some years under mental strain, through various diseases of her child, and because of financial troubles; is weak and languid, often depressed; suffers from disturbances of digestion, backache and sleeplessness. Has had two Weir-Mitchell cures before coming under my observation, for so-called nervous prostration.

During the two years of my observation she had, within a period of four months, several attacks of weakness, accompanied by a small, weak pulse, rapid and irregular. These attacks would last from one to three days. After the attacks her voice was weak and shaky; she talked as if with effort, and her limbs trembled and were rather unsteady, and she had a fine tremor of the hands. This condition persisted for weeks. At various times the slight exophthalmos which was always present, was markedly increased, especially at the time of the attacks.

Retroflexion was corrected by pessary. Local treatment, care in diet, tonics, drugs for her insomnia, and ovarin, have improved the patient decidedly. Has no hysterical stigmata, no fears, no anxieties. This case, in all its characteristics, resembles more a mild form of Basedow's disease than any other condition to which I can refer. Under observation two years. Diagnosis made on general condition, "attacks," tremor, shakiness of legs and exophthalmos.

EXOPHTHALMOS WITHOUT TACHYCARDIA, BUT WITH
GENERAL SYMPTOMS.

CASE XXVI.—Mrs. M.; 31 years of age; o-para; decided dysmenorrhea; scanty menstruation; hypoplasia uteri. The patient was subject to attacks in which her pulse was rapid and small and irregular, and as high as 120, continuing so for several hours; became very weak in these attacks, but did not lose consciousness. Her state was one of cardiac excitement, generally preceded by disturbances in the gastric region. Suffers frequently from indigestion, flatulence and constipation. Patient is nervous in temperament, nervous in the company of strangers; is never comfortable in a large crowd or at the theater; is fearful that she may lose her mind. Following some of the severe attacks, there was weakness of the voice, a trembling in the legs and tremor in the hands, lasting for days. Patient said, "her legs trembled, but you could not see the tremor." A mild degree of exophthalmos is always present, and during the attacks is noticeably increased. Most of the attacks occurred *shortly before her menstruation*. Under observation three years. Diagnosis made on general condition, "attacks," shakiness of legs and exophthalmos. Improved by hydrotherapy and ovarin.

TRANSIENT EXOPHTHALMOS WITHOUT TACHYCARDIA,
BUT WITH GENERAL SYMPTOMS.

CASE XXVII.—Mrs. S.; 35 years of age; married ten years; o-para; scant menstruation; hypoplasia uteri; sterile; happily married; intelligent, intellectual woman, active and alert. Her symptoms have been nervousness, irritability, mental restlessness; is easily and decidedly annoyed by slight details; mental unrest; cries easily, whenever her symptoms become worse, at which times dyspepsia and flatulence are marked; has taken several rest cures and has been treated by hydrotherapy. In consultation, diagnosis given was neurasthenia. Her symptoms have always been more pronounced at the menstrual period.

About a year ago was annoyed by a general itching over the entire body, which lasted for five weeks, during which all her other symptoms came on in pronounced form. Was treated by hydrotherapy for four months, and then was given ovarin and antithyroid. Is now living in the country in the open

air, and when free from irritating annoyances is relatively well.

Inasmuch as many cases of menopause, artificial or otherwise, particularly those who bleed, have few vasomotor symptoms, but other symptoms of a nervous nature, I have considered this case one of relative Basedow, the more so since at times there is a noticeable exophthalmos. The irritability, the mental restlessness, the changes of mood are marked. Under observation six years. Diagnosis made on general condition, exophthalmos.

NERVOUSNESS AT CLIMACTERIC AGE, ACCOMPANIED BY GRADUAL
DIMINUTION OF MENSTRUATION, WITH NO TACHY-
CARDIA, BUT WITH GENERAL SYMPTOMS.

CASE XXVIII.—Mrs. A.; 44 years of age; 4-para; menstruation regular, but gradually becoming less in amount. For the last year and one-half, observes occasional slight flushes; complains of pains in the back, in the legs and a dull feeling in the head. Has grown extremely irritable; cries readily; is annoyed by the slightest irritations, and is often mentally depressed; suffers from sleeplessness; considers her whole nature to be decidedly changed and occasionally asks if there is danger of her losing her mind; no anemia; no tachycardia; no feelings of anxiety; palpitation is noticeable during periods of excitement. Under observation three years. Diagnosis made on general condition. Improved by hydrotherapy and ovarin.

Referring to digestive disorders of neurasthenia, Clarke mentions dyspepsia, or some form of gastrointestinal disorder, flatulent dyspepsia, etc. Concerning the symptoms referable to the heart and circulation in neurasthenia, he mentions that the pulse in many cases is between 80 and 90, that it is occasionally 100 to 120, and that if a fine tremor is present it is hard to make a diagnosis from the aberrant forms of Basedow's disease. I have purposely classed together cases under Group A, 16 to 21 in all of whom a rapid pulse was present. Case XVI is one of persistent tachycardia, with gastrointestinal symptoms and general nervous symptoms, in whom, beyond doubt, Basedow's disease was present. Case XVII, after a complete hysterectomy, developed tachycardia with general nervous symptoms of a typical nature, made worse by thyroid, and benefited by ovarin. Case XVIII, pregnant six and one-

half months, develops suddenly tachycardia with typical general symptoms. Case XIX, a 1-para, develops tachycardia with general nervous and dyspeptic symptoms of exactly the same nature as XVIII, and is vastly benefited by ovarin. In fact, no two cases could be more alike in their symptomatology. Case XIX was decidedly improved by the administration of ovarin. Case XX, in whom a castration was done over a year ago, on the administration of thyroid, develops tachycardia with typical general nervous symptoms. Case XXI, beyond the menopause age, but still menstruating, suffers from tachycardia and typical dyspeptic and nervous symptoms. We have here six cases of totally different predisposing conditions, in all of whom tachycardia and dyspeptic and nervous symptoms bear a most marked resemblance. In other words, they are all cases remarkably resembling aberrant forms of Basedow's disease, and constituting cases of this disease, or hyperthyroidism.

The next group comprises eight cases, Group B, three of which have been quoted before, in none of whom tachycardia was present, but the interresemblance of their symptoms is quite marked. Case XXII is Basedow's disease, with no tachycardia, but with general nervous symptoms, made decidedly worse by thyroid and benefited by ovarin. Case XXIII is an aberrant form of Basedow's disease with no tachycardia, but with general symptoms. The patient was made worse by the administration of thyroid, which brought on the previously experienced causeless and persistent diarrhea, tremor and shakiness of the legs. This patient is benefited markedly by ovarin. Case XXIV and XXIVa are instances of castration, with moderate nervous symptoms corrected by ovarin, in whom the administration of thyroid brought on, very quickly, nervous phenomena, resembling the other cases of the same group. Case XXV is an instance of exophthalmos, with no tachycardia, but with pronounced general symptoms. Twenty-six is an instance of exophthalmos, with no tachycardia, but with general nervous symptoms. Twenty-seven is a patient with exophthalmos, but no tachycardia, but with characteristic nervous conditions, exactly like the other instances. Twenty-eight is a patient at the menopause age with no tachycardia, but with general nervous and dyspeptic symptoms, as typical as one might wish to see. In other words, we have here a group with symptoms like the group with tachycardia. In this group,

with the exception of the absence of the tachycardia, the resemblance of the other nervous symptoms is decidedly marked. Of this second group, Cases XXV and XXVI have been subject to attacks of a peculiar nature.

Clarke, under neurasthenia, mentions attacks of nervousness, "there is a feeling of faintness, starting from the epigastrium or the heart, passing up to the head, with a sensation of vague, undefined fear, the legs tremble, the face flushes, the tongue is dry. There is perspiration and a desire to urinate and defecate." Among other symptoms are, attacks of tachycardia after excitement or mental strain. There is oppression in the chest, precordial pain and feelings of faintness. He says that there is a tendency for the blood to drain into the splanchnic area, and that the ventricular force is weakened, the heart's action is rapid and feeble, and this explains attacks of syncope. Were we to consider the above observations, we would certainly be justified in considering Cases XXV, XXVI and XXVII, as instances of neurasthenia. But, I have observed all three for over two years, and from a knowledge of their general condition, their mental tendency and emotional causes, I still consider them, not because of their exophthalmos but because of the general nervous symptoms, as having the same etiology as the other cases of this group. For almost all nervous conditions associated with gynecological diseases, the diagnosis rests between hysteria or neurasthenia on the one hand, and the various diagnoses which we have made on the other. Clarke says that neurasthenia is mostly a disease of brain-workers, especially of those who live under stress of disadvantageous circumstances. The strain of child-bearing and lactation are a cause in many women. Among other causes mentioned, are overwork, and overstrain; depressing emotion; the abuse of stimulants, narcotics and tobacco; the infectious fevers; the abuse of sexual functions; eyestrain, etc. In none of the cases in Group A and B is there any such etiology, excepting the possibility of depressing emotions. There is certainly no local adequate cause in these patients sufficient to explain the symptoms on the basis of reflex neurosis, even to the most enthusiastic believer in such an etiology.

In some of the cases of Group B, we cannot place the finger on any definite set of symptoms which can be considered as absolutely typical. We can simply say that their resemblance to the symptoms of the severe cases at the climacteric

age, the symptoms of the climacterium, of castration, of aberrant Basedow's disease is too marked to be lightly considered. The study of cases and continued observation mean more than can be put into written words, and my conclusion is that all the quoted cases have practically the same basis and that this basis is a relative degree of hyperthyroidism. It would be certainly easy to consider them all instances of asthenia of the nervous system, but this term simply mentions a state and gives us no idea of the condition which is the causative factor. The action of thyroid in a large number of them, and the marked beneficial action of ovarin, which was given to all, excepting Cases XVI and XVIII, are additional factors in support of this etiology.

CORRECTION.—On page 306, line 33, the word headache should be backache.

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134 WEST EIGHTY-SEVENTH STREET.

TRANSACTIONS OF THE WOMAN'S HOSPITAL SOCIETY.

Meeting of November 28, 1905.

The President, DR. MALLET, in the chair.

DR. LEROY BROWN reported a case of

HYSTERECTOMY FOR MULTIPLE FIBROIDS.

He mentioned the case because of marked mitral disease and cardiac hypertrophy associated with a fibroid tumor only intrapelvic in size.

On account of the interest attached to cardiac disease associated with fibroid tumors of the uterus, a short time ago he obtained from the State Hospital a report of cases operated on for uterine fibroid growths. The period covered was two and one-half years. Some thirty-five such operations were done, and among these, cardiac disease was found in a little over one-third of the cases.

DR. CLEVELAND.—Eight years ago I operated on a woman at the Woman's Hospital.

She had been infected and it was necessary to remove the uterus and adnexa. She made a good physical recovery, but her mind became more or less disturbed and she has not been in perfect mental health since. She is not insane enough to be put into an

institution. She cannot read to enjoy herself or do any connected mental work.

She came to me a week ago and I found that she had been suffering for several weeks with pain on the right side. A vaginal examination disclosed nothing in the pelvis. The kidney was slightly movable on the right side, but directly over McBurney's point she was exceedingly sensitive; so much so that I thought there was trouble with the appendix. (She was suffering from obstinate constipation.) I called Dr. Bissell in to see her and he made an independent diagnosis, that the appendix was diseased, and we came to the same conclusion—that we had better operate to break up any adhesions and remove the appendix.

On opening the abdomen I found marked adhesions, especially in the pelvis where the sigmoid was attached very firmly. After breaking up the adhesions I removed the appendix. It did not appear to be diseased, but it had two strictures and was occluded at its proximal end. She made a good recovery. Her general condition is improved. Her mental state I attribute to the sudden bringing on of the menopause.

PREGNANCY COMPLICATED BY OVARIAN CYST.

DR. GRAD.—The patient was first seen eighteen months ago, during her confinement. At that time there seemed to be an obstruction to the delivery. Our manipulation displaced the tumor and delivery was effected very readily. The patient again presented herself when four months pregnant, complaining of a great deal of pain and nausea. On examination I found a tumor in the pelvis crowding the pregnant uterus, which was found retroverted. The organ was replaced and a laparotomy advised, to which she submitted two weeks ago. The tumor proved to be an ovarian cyst the size of a fist.

She has made a very good recovery and is going on with her pregnancy.

GUMMA OF LIVER.

DR. MALLETT.—In a case which I reported at the last meeting I made a large incision and exposed the liver. Before the operation the patient developed signs of jaundice, and I thought she had some liver complication. I made a large incision, exposed the liver and closed the wound, under the impression that it was a carcinoma of the liver. Before closing I took a slice of it for the pathologist, and he reported a syphilitic gumma.

I did not believe it could be true, so I sent the specimen down to the College of Physicians and Surgeons, and the doctors there corroborated the diagnosis. The patient did well under specific treatment.

I was speaking to Dr. Brewer of the case and he said that during his service at Mt. Sinai he had met two such cases, and in neither had he made a diagnosis.

DR. WEST.—I can readily understand how there would be degenerative changes in the vascular system in cases of large fibroid tumors which have existed for years, yet I see no reason whatever

why a small fibroid, a little nodule in the uterus, should make any serious modification of the vascular system. I should have to have the proofs before I would be convinced. There is no reason why a patient with a fibroid tumor should not have a heart or kidney lesion as well as anybody else. We often find these patients not only with diseases in the pelvis but a general diseased condition.

DR. GRAD.—It is very difficult to explain so many sudden deaths in fibroid cases unless we assume that changes occur in the organs directly as a result of the tumor. The theory has been advanced that fibroids throw toxic material into the circulation, and it may be in that way that they bring about changes in the organs of the body, particularly in the cardiac muscle.

DR. HARRISON.—I am opposed to all hypotheses that have no basis of proof. Now I would like to know where the proof is and how you can say that fibroid tumors produce toxins. All the cases I have seen of post-operative thrombosis were due to hemorrhage or myocarditis. I operated not long ago on a lady for a tumor of the leg. The wound healed up by primary union and everything went well, when suddenly there developed a pneumonia with symptoms such as to make the diagnosis of embolism justifiable. The patient was convalescing rapidly and I was thinking of discharging her from the sanatorium, when suddenly she had a similar attack and died at once.

DR. GRAD.—I wish to say in reference to Dr. Mallett's case of mistaken diagnosis that I had a case which I thought was malignancy of the liver. A piece of tissue was removed and proved to be a gumma. This is quite a common error in diagnosis. A similar case came under my care in the person of a soldier in whom we suspected syphilis. The tumor of the liver seemed a large one and exploratory incision was made. On opening the abdomen there was present a large nodular tumor in the liver, and we made a diagnosis of a carcinoma. Under very large doses of iodide he rapidly improved, and gained something like thirty pounds in weight. These cases must be quite common.

DR. WEST.—I believe it is quite possible for sarcoma to develop from a fibroid but not from a carcinoma. If such changes occur they are extremely rare, nothing like as frequent as has been represented during recent years. In the fibroid there is connective tissue growth and a sarcoma is a connective tissue growth.

PREGNANCY COMPLICATED BY DERMOID CYST.

DR. CLEVELAND.—Last spring I had a particularly interesting case brought to me by a physician who said he had made a diagnosis of retroflexed adherent pregnant uterus.

The woman was very stout and it was difficult to make a bimanual examination. I found a mass behind the uterus which seemed to be a flexed fundus. She had passed over three periods of menstruation. I put her in the knee-chest position and tried to lift her uterus, but did not succeed. I examined her a second time a few days later and felt that I could indistinctly make out

a large uterus through the abdominal wall. I came to the conclusion that it was a tumor, either a tense cyst or a fibroid. I called another gynecologist in consultation. He made an examination and came to the conclusion that it was the result of some inflammatory process. There was no doubt of the pregnancy. We decided that operation was necessary because it would be impossible for her to bear a living child. But the greater danger would be to the woman herself. I opened the abdomen and the uterus was then four and one-half months advanced. I found great difficulty in passing my hand down into the pelvis, but succeeded in doing so and drawing out, without rupture, what proved to be a dermoid cyst of the right ovary. All went well and she has since been confined successfully.

DR. GEORGE TUCKER HARRISON and DR. DOUGAL BISSELL then read papers on

WHAT INFORMATION CAN WE OBTAIN FROM SYMPTOMATOLOGY IN GYNECOLOGICAL CASES?*

DR. CLEVELAND.—Dr. Harrison's paper was very exhaustive and most interesting, and I certainly felt the greatest interest in listening to it. I feel that I can add very little.

The symptom that Dr. Bissell speaks of, backache, is one that I think all gynecologists recognize as most important. It accompanies many of the diseases of the pelvis, and especially displacements. The backache, to my mind, is the prime symptom of displacements, but I never place any confidence in it as a symptom without examination.

DR. WEST spoke of dysmenorrhea caused by an abnormally hard and cartilaginous cervix and said it could be very surely relieved by amputation of the dense tissue.

DR. GRAD.—I had an experience this summer with a case in which the general symptom was backache. This patient came to me with the complaint that she had been suffering with backache for the past seven years. She had been seen and treated by many practitioners for muscular rheumatism.

The only thing I found was a small fibroid in the anterior wall of the uterus. The chief reason that she wished me to examine her was that she was suffering with frequent urination. Four or five times a night and from ten to fifteen times a day she had to empty her bladder. With the idea that this fibroid might be the cause of the frequent urination, I advised a laparotomy. She submitted to the operation and I was surprised to find two old pus tubes very much adherent. Both tubes and ovaries were removed. The appendix was also removed. The fibroid was enucleated and finding no other fibroid, I left the uterus. During the time she was in bed her backache absolutely disappeared. Within two weeks after she was out of bed her symptoms returned.

I took a series of x-ray pictures of her spine and I found that between the fourth and fifth lumbar vertebrae the intervertebral substance was gone. There is a small curvature in that spine.

*See original articles, pages 501 and 509.

For this curvature the patient was seen by an orthopedic surgeon who diagnosed spondylitis. She was treated by him, but she was not relieved of her backache.

The symptom of metrorrhagia bears a great deal of investigation. I had a patient who presented this one single symptom. During the last twelve years she has been curetted sixteen times. Every time she has been curetted her metrorrhagia ceases, and then it returns. Dr. Ill opened the abdomen and looked in, but he found no pathologic disturbance. She bleeds to such an extent that she has to go to bed and has to be packed. Recently I suggested that she take adrenalin during one of her attacks. She has not had metrorrhagia now for over four months. She thinks that it might be due to the adrenalin because it stopped very promptly after she took it. She does not want to submit to a hysterectomy.

DR. CLEVELAND.—I would like to speak of the dysmenorrhea and sterility which sometimes follow the improper use of the sharp curette.

During my experience I have seen quite a large number of cases where patients have been curetted by men not skilled in the use of the instrument. It is customary nowadays for nearly all general practitioners to carry in their bags a speculum and sharp curette. As a result nearly every patient who comes to see you has had a curettage performed by her family physician. These men think themselves perfectly competent to do this operation, and that it is nothing. To my mind they are doing a great deal of harm. They not only scrape away epithelium and mucous membrane of the uterine cavity, but even the basic membrane, so that as a consequence the uterine cavity is a mass of cicatrices and the symptoms are excessive dysmenorrhea, and almost amenorrhea. She flows very little for a few hours of one or two days, and not only is she subject to great suffering, but sterility often follows.

I believe that it would be far better for woman if the sharp curette were not employed at all, it is used so excessively and abominably by the general practitioner.

DR. HARRISON.—When I first commenced my career as a gynecologist we devoted our attention very largely to the cure of antelexion. A thing that astounded me was the frequency with which we met antelexion. It struck me as a very remarkable thing that a pathological condition should be so frequent. To relieve the antelexion Dr. Sims performed the lateral incision, Dr. Emmett divided the cervix backwards, and in certain cases of congestive antelexion he ran his knife in front. He had the most earnest belief in antelexion as a general pathological condition. In my mental development it was a complete revelation to read a paper by Schultze on the normal position of the uterus. His demonstration was complete and absolute. His views were accepted by most gynecologists throughout the world. He believed that antelexion was only pathological when you had

an inflammation in the uterosacral ligaments which fixed the uterus. The true pathological condition is not the form of the uterus—that is absolutely not pathological—it is the fixation that constitutes the pathological feature. The doctrine of Schultze is attacked by a great many because, as they assert, it has not been proved in the dissecting room. There is one thing certain, that you do have inflammations along the uterosacral ligaments. Schultze calls it posterior parametritis.

Referring to the question Dr. Grad has brought out about metrorrhagia, there are some of these cases where no local treatment would do any good. I was compelled in such a case not long ago to perform a hysterectomy.

I agree heartily with what Dr. Cleveland has said about the use of the curette.

TRANSACTIONS OF THE WASHINGTON OBSTETRICAL AND GYNECOLOGICAL SOCIETY.

Meeting of November 3, 1905.

The President, G. B. ACKER, M.D., in the Chair.

DR. JOS. TABER JOHNSON reported a case of VAGINAL HYSTERECTOMY, with the specimen.

Mrs. M.; aged 35; white; mother of one child eight years old, was operated on by me three years ago for a combined inflammation of the vermiform appendix, right tube and ovary. She made a good recovery and remained fairly well for about one year, when she began to have severe pain at her monthly periods and a more or less constant pain in her left ovarian region. She had a complete unilateral laceration of the cervix which should have been repaired before, but she would never consent to the operation. She was in no condition to have it done at the time of the above-mentioned operations, as her illness was acute and severe and it was thought that she could not stand further surgery that day.

Mrs. M suffered so continuously with endometritis, dysmenorrhea, salpingitis and ovarian pain, that she finally become clamorous for a radical operation which would permanently relieve her sufferings. The three months preceding her last operation she spent either in or on her bed. When informed that to be cured she would have to have the uterus dilated and curetted, the lacerated cervix restored and her left ovary and tube removed through an abdominal incision, she very wisely decided that she would prefer to have the uterus and remaining ovary removed entirely than to have them patched up now and remain subject to possible renewal of her sufferings in the future.

She accordingly went to the Georgetown University Hospital and I removed the uterus, left ovary and tube through the vagina by the clamp method. The operation was completed inside of thirty minutes. There was scarcely any shock and convalescence was uneventful.

DR. I. T. KELLEY reported two cases. First case, FIBROMA OF THE UTERUS.

Miss B.; age 47 years; white; unmarried; menstruated first at 16 years, flowed four days, not painful.

Patient first noticed growth in abdomen five years ago. It caused her no uneasiness except painful micturition. After one year was at times unable to pass her water and had to be catheterized. Abdomen increased rapidly in size in the last year. She has become also very constipated since growth of tumor, and her bowels only moved when in liquid state. She was led to have tumor removed because of trouble with bladder and pressure on the rectum.

Entered Sibley Hospital three weeks ago, having been sent by Dr. Holden. Examination showed large multiple fibroids, the largest filling the pelvis. The specimen shows the largest tumor to have a groove corresponding with the position of the rectum.

The uterus was pushed up out of the pelvis and has in its walls several fibroids.

The ovaries are cystic.

Second Case, TUBOOVARIAN ABSCESS AND PYOSALPINX.

Mrs. D.; white; age 42 years; first menstruated at 10 years, then not again for four years; now regular flow lasting eight days; last menstruated October 5. Married at 26 years. One miscarriage; no children. Had pain in pelvis in 1893. In September, 1905, was again taken ill with pain in pelvis and began to have fever, chills, and night sweats. On examination a large fluctuating mass occupied the left pelvis. A smaller mass higher up on the right side proved to be a large tuboovarian abscess, which was removed entire. The left pyosalpinx, with very wide mouth grasping the peritoneum of the posterior cul-de-sac was ruptured during removal. Convalescence was smooth.

The essay of the evening was read by DR. KELLEY.

TYPHOID FEVER IN PREGNANCY.*

DR. SPRIGG thought the diagnosis of typhoid fever difficult in the puerperium owing to its liability to be confounded with septic conditions. Abortions in these cases are caused by the high temperature rather than by the typhoid poison itself. The treatment would be that of typhoid fever in general, that is, supporting, favoring the elimination of toxins, and the reduction of the temperature by baths and sponging. Abortion should not be induced, as it is only an unnecessary shock to the patient.

DR. MORAN said that the mortality was due to the hyperpy-

*See original article, page 529.

rexia. No advantage would be gained by an abortion, and the treatment should be that of typhoid in the non-pregnant. He has diagnosed several cases during the puerperium before the Widal test was made and the diagnosis was later confirmed by the test.

DR. S. S. ADAMS has seen three cases in consultation. In the first case there was delirium and high temperature. He gave a bad prognosis. The woman was delivered and both she and the child lived. In another case he gave a more favorable prognosis. The woman aborted and recovered. He does not believe that an abortion should be performed during the fastigium owing to the liability of hemorrhage; later in the disease it may be an open question, but he believes it should not be brought about.

DR. MORSE had one case who miscarried at 6-7 month and died of hemorrhage.

DR. LOREN JOHNSON said that the leucocyte count is not of great value during the puerperium.

DR. J. TABER JOHNSON had a case in which he thought a pus tube was forming during pregnancy. It proved to be typhoid fever and the case recovered.

DR. ACKER had a case in a young woman who had fever and pains in the abdomen. The child (8 1-2 months) had fever immediately subsequent to birth and recovered. The mother also fully recovered. Did the child have typhoid and is it protected now from the disease?

DR. MORAN stated that the Widal reaction is present in fetuses showing that the antitoxins as well as the toxins are in the blood. Bacilli are at times found in the tissues of the fetus, probably on account of a damaged placenta.

Meeting of November 17, 1905.

The President, G. B. ACKER, M.D., in the Chair.

THE essay of the evening was read by DR. I. S. STONE.

CANCER OF THE BREAST. END RESULT IN TWENTY-FIVE CASES. DEMONSTRATION OF A NEW FLAP METHOD.*

DR. BALLOCH said that with regard to the protozoan theory of cancer he was of an open mind, but that there were objections which were, to him, insuperable. Some of these objections were:

1. The bodies appear in the degenerating portions of the cancerous growths.
2. They do not appear in the metastases.
3. They are found in non-cancerous growths and tissues.
4. No two observers describe the same type of organism, and each seems to rely on peculiar staining methods to demonstrate the particular body which he thinks the cause of the disease.

*See original article, page 525.

5. The one thing that we are certain of in cancer is that the liability to it increases with age. In this it is different from all microbic or protozoan diseases.

He would like to believe in the parasitic origin of the disease, as it would open up new and hopeful lines for the treatment of cancer, but at present it seems to him that we must regard it as not proven.

The history of the operations for cancer of the breast illustrates very well the fact that all progress in surgery is slow and steady and not by leaps and bounds. First we had the removal of the growth only; then the entire breast; then the fact that the axillary glands were frequently involved led to their inclusion in the tissue to be removed. Gross, with his acute surgical judgment, recognized the fact that recurrences in the skin were frequent, hence his recommendation of his "dinner-plate" incision. Then Heidenhain demonstrated that the growth frequently involved the pectoral fascia, so that tissue must be included. Thus we have worked up to the present Meyer-Halsted operation. Halsted and Meyer published their methods, independently, at about the same time and each is entitled to equal credit. Dr. Balloch thought that Meyer's operation was preferable, in that he began at the humerus and worked inward.

Regarding the form of flap advocated by the essayist he was of the opinion that the best results in breast operations would be attained by disregarding entirely any attempt to make the flaps meet. We should not lose sight of the fact that, morphologically, the breast is an appendage of the skin and that there is usually a much wider skin-infiltration than we suspect. In his own work he removed as wide an area of skin as he thought necessary, regardless of any bringing together of the flaps. The resulting wound-edges were brought together so far as possible without tension. The denuded area left exposed was then circumscribed by a subcuticular suture of heavy silk or silkworm gut, which was tightened as much as possible and tied. If any area then remained exposed it was covered by skin-grafts.

Recurrences in cancer of the breast are in the form of internal metastases and recurrences in the skin. Over the former we have no control. We can influence the latter by a wide excision of skin and no cosmetic considerations should influence us to disregard this. Dr. Stone's cases were too recent to warrant any conclusions as to liability to recurrence in the skin after this form of flap, and he, Dr. Balloch, preferred to await results before changing his own technique.

DR. I. FORD THOMPSON.—Carcinoma is increasing. The evidence of the parasitic origin of cancer is not yet sufficient, but he believes in the theory. An early operation is demanded and in each case the most radical operation should be done. Educating the public to the early application for treatment is desirable.

The flap should be made to suit each individual case.

He is more hopeful now of cure than he was a few years ago.

In the future we will cure seventy-five per cent. of cases by an application of a thorough operation such as Halstead's.

DR. BARTON.—The general practitioner should carry every case of carcinoma of the breast to the surgeon as soon as he sees it. He mentioned a case of Schirrus cancer of the breast with no retraction of the nipple, no hardening of the breast, and no deep adhesions. A recurrence in the scar was cured by the *x*-ray.

DR. RANDOLPH believes in the earliest possible diagnosis and the radical removal. He had a case in which in a few weeks a tubular adenoma of the breast changed into carcinoma and invaded the axillary glands. The fibroadenomata frequently change into carcinoma.

DR. ABBE.—*X*-ray is not a substitute for an early operation in cancer. Recurrent cases showing nodules treated by *x*-ray are very often cured when these nodules are superficial.

DR. WHITE.—The new flap operation gives primary union in a few weeks, much earlier than the former methods.

DR. BOVÉE stated that simple rubber wicks are the best drains.

DR. STONE said the removal of the uterus and ovaries for the cure of cancer of the breast has been abandoned.

Meeting of December 1, 1905.

The President, G. B. ACKER, M.D., in the Chair.

DR. STONE presented the specimen and report of a case of

SALPINGO-OOPHORECTOMY IN A WOMAN TWO MONTHS PREGNANT.

Mrs. X, colored, entered Columbia Hospital November 22. She had been in apparently good health until three weeks prior to her admission. Her complaint was pain in stomach and back. Temperature was 98.6 and pulse 96 on admission. Tenderness was marked and a mass distinctly felt in the right ovarian region. The house staff had decided her condition to be tubal pregnancy and there were fairly good reasons for this suspicion.

Operation on November 25 revealed a pregnant uterus and a large mass on the right consisting of omentum, appendix, tube and ovary, the latter being adherent to the ileum several inches from the cecum. The operation was completed in the usual way, by removal of the tube and ovary from the broad ligament and bringing them out of the wound with the attached bowel before separation was made. The ileum was not opened, although its walls were greatly thickened. The appendix appeared to have attached itself to the tube and to have been drawn downward, pulling the cecum along with it. When it was separated from the specimen the appearance of the attached portion indicated that infection might have extended through the appendix walls to the ovary and tube. The extensive adhesions about the appendix region and extending upwards between the omentum and abdominal wall would appear to justify this opinion.

DR. STONE said further that he reported the case to ask an expression of opinion as to whether the infection occurred from the appendix or from the Fallopian tube. There was no apparent disease of the left tube and ovary.

DR. BOVÉE said that there were several points of interest in connection with the specimen. Did the infection occur during or before pregnancy, and did it come from the appendix or the tube? If there was a corpus luteum in the infected ovary it is probable that the infection had occurred during pregnancy. (Dr. Stone said that no corpus luteum was noticed.) He (Dr. Bovée) thinks it possible that the infection occurred through the tube and thinks the attachment of the two was probably due to contiguity. With, however, a history of two weeks' duration of the illness, he believes it improbable that the infection came from the tube. He had a case of pregnancy with double pus tubes. The case went to term after the removal of the tubes.

DR. BALLOCH.—It would be interesting to know the infecting bacteria in this case. If the colon bacillus caused the abscess the infection came most likely from the vermiform appendix.

DR. PRENTISS believed the process in the tube an old one on account of the thickness and induration of the walls of the sac.

DR. STONE said that in the case of another patient he had positive proof that an infection of the tubes came from the vermiform appendix. He opened the abdomen for appendicitis and found the tubes normal. During convalescence from the operation the tubes became successively infected and had to be opened through the cul-de-sac of Douglas.

DR. MILLER remarked that because the tubes were not diseased at the appendix operation and became so during convalescence it did not *prove* that they were infected from the appendix. It is quite possible to have a gonorrheal infection of the uterus spreading to the tubes after an appendix operation.

DR. BALLOCH read the paper of the evening.

SOME OPERATIVE AIDS IN ABDOMINAL WORK.*

DR. BOVÉE opened the discussion. He believes in carrying out the detail of technique in the strictest manner. Surgery of the abdomen now is not so much a matter of lowering mortality as of lessening the morbidity. He does not use eserine, and gastric lavage is limited to cases in which vomiting of dark, grumous material takes place during anesthesia. If the anesthetic is given steadily and cautiously there is less vomiting. If given irregularly, retching occurs, and in these cases lavage is practised. He gives liberal quantities of water after operation, hot at first and afterwards cool. If vomiting occurs it tends to wash out the stomach. Nothing but water is given for the first twenty-four hours. One should study every case carefully before operation. In many cases the first evidences of renal insufficiency occur after operation. In one of his cases after five minutes' anesthesia for curettage partial suppression of urine occurred, only three ounces being excreted during twenty-four hours for

* See original article, page 484.

three days. The preliminary examination of the urine was not made before operation, as the operation was done at home and the amount of anesthetic to be used was so small. The purgation of patients preparatory to operation has been overdone. The bowels should be moved thoroughly. The enemata should have plenty of time, as they are frequently not expelled for several hours. The examination of the heart and arteries is very important, especially in cases of fibroids, as they are very liable to be diseased in these cases. He disagrees with the essayist in the use of non-absorbable sutures in the intestines. He uses absorbable sutures everywhere except for traction. He believes in the use of angiotribe. He thinks that the dangers of the use of salt solution is not fully appreciated. French experimenters eight or ten years ago showed that in dogs the use of large quantities caused effusions into serous cavities and enlargement of the spleen. It is more dangerous when used in veins under the skin. It causes more disturbance of the circulation. In some cases of renal congestion salt solution has harmful effects.

DR. ASHFORD asked about the use of scopolamin and morphine preparatory to operation. He has seen it used in forty or fifty cases. These cases, when compared with an equal number where it was not used, seemed to require less anesthetic and had markedly less nausea.

DR. LEWIS said he did not agree with the essayist in the preparation of the alimentary tract. We know how difficult it is to fully clear out the alimentary canal from fermentative products and bacteria. A sad experience of his taught him the value of thoroughly emptying the canal. After a short operation in a child convulsions and fever developed within twenty-four hours, and the child died in convulsions. Its death, he thought, was due to intestinal autointoxication. He thinks it much better to thoroughly clean out the intestinal tract prior to operation.

DR. MILLER said the accurate determination of the malady from which the patient is suffering, and a careful examination of the heart, lungs, kidneys, and so forth, is regarded as essential to good surgery. At one time some abdominal surgeons said they never made a diagnosis until they opened the abdomen. This principle is absolutely wrong; we should always try to make a correct diagnosis before we attempt to relieve the condition by surgical interference. As an example, we should, if possible, differentiate between the nature of the infectious processes and between benign and malignant tumors. He thinks the limit set by von Bergman, as quoted in the paper, for the percentage of hemoglobin is too high. It is frequently necessary to operate upon patients in whom it is impossible to get the hemoglobin to this standard (50 per cent.) and at times it is necessary to operate with it below 35 per cent. We should, however, always try to have our patients with a high percentage of hemoglobin, and much can be done to increase this by rest in bed, food, iron, and arsenic. He believes the value of eserine, scopolamin,

and so forth, to be exaggerated and the dangers not yet all discovered. In five years it is doubtful if either is in use. It is probable that they have many more dangers than salt solution given by hypodermoclysis. The belief that one may relieve an intestinal obstruction by eserine will doubtless in a number of cases cause a fatal delay in opening the abdomen.

DR. STONE said it is absolutely impossible to clean out all of the bacteria from the intestinal canal. In nearly every hospital in the country there is a reaction against excessive purgation, and less time is given to skin preparation. Mayo brothers find that emergency cases do just as well as others so far as healing is concerned. He has not arrived at any definite conclusions as regards eserine, but he believes purgation either before or after operation harmful. The value of gastric lavage is doubtful, and he does not practise it as a routine procedure.

DR. PRENTISS suggested the use of an antiseptic (intestinal) before operation, such as salol or the carbonate of guaiacol. In regard to the kidneys in people past middle life you can generally tell by the blood pressure whether or not they are diseased. In arteriosclerosis which accompanies kidney diseases there is an increase in blood pressure. In a series of cases examined at the Freedman's Hospital, where there was marked increase of blood pressure there was also albuminous urine or other evidence of kidney changes in nearly every case.

DR. KELLEY recalled the case of a woman whom he operated upon several years ago and reported to the society. Her skin had not had the usual preparation and she was operated upon the same day upon which he first saw her. He was duly criticised by most of the members for his rashness.

DR. ABBE believes that many more cases could be operated upon under cocaine and morphine anesthesia than is now done. By avoiding general anesthetics we can avoid pneumonia and kidney complications.

DR. BALLOCH believes salt solution has been used too freely. He protests against hypercatharsis. Eserine is useful where intestines are handled but not where they are injured. A preliminary dose of atropine is useful to give before eserine. If this is not done the pulse rate is apt to run up. In regard to local anesthetics, Miculicz found more post-operative complications in cases where local than where general anesthesia was used.

Adjourned.

Meeting of December 15, 1905.

The President, G. B. ACKER, M.D., in the Chair.

DR. SPRIGG read the essay of the evening:

TWO CASES OF SLIGHT VAGINAL ATRESIA COMPLICATING LABOR.*

DR. MORAN said that Edgar classified atresia of the vagina into congenital and acquired. The congenital is a constriction at any

* Paper not received.

part of the vagina, but is especially apt to occur at its upper third. The septum may be either imperforate or partial. The acquired atresia is traumatic. In a patient whom he delivered there was a small vagina which caused a difficult labor. The child was delivered by version with considerable trauma to the vagina and subsequent contraction. It was thought that any subsequent labor would be very difficult. However, with the next pregnancy there was a softening and apparent absorption of the cicatricial tissue and the labor was easy. In a second case there was a septum one inch below the cervix. This was oblique and was one and one-half to two inches in depth, forming a cul-de-sac. This was torn during labor. The etiology of the septa is not well understood.

In most of the reported cases the maternal death rate is 13 per cent. and the fetal death rate two to three times as great. Hirst has recently reported cases of contracted pelvis with atresia in which he did the Porro operation. In most cases delivery will result spontaneously. It may be necessary to dilate or incise, and occasionally to perform the Cesarean section.

DR. ABBE said the second case reported by the essayist brought out two important points. The urine was markedly albuminous, and apparently the only treatment was to give large quantities of water and with good results. Was this the only treatment? The second point was the dilatation of the cervix without anesthesia. Can this be generally done? He has never seen a case of vaginal atresia in labor. In a case seen in his hospital service the closure of the vagina and vulva was so marked that the woman could, with difficulty, be catheterized under anesthesia. From the outside there was no evidence of any vagina except the scar. The closure was thought to be an attempt to make the vagina take the place of the bladder as a receptacle of urine.

DR. MILLER said that he had never seen a case of atresia of the vagina in a woman in labor. In a colored girl seen a few years ago in his dispensary service there was a transverse septum about an inch below the cervix. An opening which just admitted the index finger was at the center of the septum. The patient came complaining of an acute gonorrheal infection. She did not return and was lost sight of. He has seen several cases of double vagina, one being in a woman who had borne several children without difficulty. In one of the cases there was a double uterus as well, and apparently a gonorrheal infection of one side of the uterus with its tube without involvement of the other side.

DR. MORGAN said he had a case of a longitudinal band complicating labor, a double vagina. The labor was slow but easy. She was delivered of another child later without difficulty.

DR. KELLEY has seen cases with bands after labor. In a case of Dr. Fry's there was a septum preventing the escape of the menstrual blood. She was operated upon, but the atresia returned. He believes she will not become pregnant.

DR. SPRIGG said, in reply to Dr. Abbe, that he used no medication other than lithia water and milk diet. There was a marked

diminution in the amount of the albumen. The percentage of solids was small, but the urea was not markedly diminished. The headache continued, and he always feels apprehensive in such cases. He did not use anesthesia in dilating the cervix on account of the kidney complication. There was little pain and no uterine contraction. Dilating the cervix generally produces uterine contraction, and for that reason anesthesia is generally necessary. There was no history of vaginal infection and the contraction of the vagina did not feel like scar tissue.

TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF LONDON.

Meeting of January 3, 1906.

The President, W. R. DAKIN, M.D., F.R.C.P., in the chair.

FIBROMYOMA OF THE UTERUS UNDERGOING SARCOMATOUS CHANGE.

DRS. W. S. A. GRIFFITH and HERBERT WILLIAMSON recorded the case of a patient fifty-six years of age, who was admitted to St. Bartholomew's Hospital suffering from sarcoma of the uterus. Six years previously she had attended as an outpatient at the same hospital on account of an abdominal tumor, which was diagnosed as a fibromyoma of the uterus.

Post-mortem the uterus was found to contain several fibromyomata, in one of which was growing a sarcoma. Secondary deposits were present in both lungs.

The authors discuss the various conditions under which sarcoma and fibromyoma may co-exist in the same uterus.

They point out the difficulty of arriving at a definite conclusion as to the frequency of the association.

They find no difficulty in accepting the doctrine that a tumor originally innocent may become malignant, and conclude that the specimen shown is an example of a fibromyoma undergoing sarcomatous change.

DR. R. HAMILTON BELL mentioned that the case of fibromyoma undergoing sarcomatous change, which had been shown to the society by Dr. Tate two months ago, had been considered by the pathology committee and that they had declared themselves unable to pronounce definitely in favor of the sarcomatous change. On the other hand, the pathological department of St. Thomas's Hospital entertained no doubt upon the point.

DR. HERBERT R. SPENCER said that he believed that sarcoma of the uterus was commoner than was generally supposed, and that it was often difficult to distinguish from fibroid. He considered the presence of large or giant cells of considerable value in distinguishing between sarcoma and an inflamed fibroid. He mentioned two cases which at the time of operation were regarded

as simple fibroids, but which on subsequent examination and on the development of secondary growths proved to be sarcomatous.

DR. WILLIAMSON, in reply, said that he agreed that when the presence of giant cells could be demonstrated the tumor was probably of a malignant nature.

PYELONEPHRITIS OF PREGNANCY.

DR. W. A. MILLIGAN recorded a case in which the left kidney was affected during the second pregnancy in a woman of twenty-three. The symptoms set in six weeks before delivery, and three weeks after a large amount of pus was evacuated from the much distended pelvis and ureter of the kidney, which was slightly disorganized. The wound was drained and a gradual cure was affected. No stone could be detected and the urine was acid throughout. In a subsequent pregnancy no recurrence of the previous trouble occurred. The causation of this condition is discussed and the opinion of various writers on the subject is quoted.

DR. R. DRUMMOND MAXWELL recorded a case in which a woman of twenty-five, when four months pregnant with her first child was found to be passing pus in the urine. She was placed on milk diet and the symptoms subsided so that she was allowed to return home. But in the twenty-sixth week of pregnancy she was received back into hospital with return of the same symptoms and delivery was induced, without, however, effecting much improvement. A fluctuating renal swelling was then detected in the left loin. A large pyelonephritic abscess was discovered from which a considerable amount of friable calculus was removed.

ADENOMATOUS POLYPUS OF THE CERVIX.

DR. F. E. TAYLOR showed microscopic sections of a polypus springing from the cervix uteri. The polypus was the size of a pigeon's egg, and had been removed from a woman of fifty-three on account of hemorrhage of five years' duration. Microscopically it is seen to consist of masses of glandular tissue surrounded by richly cytogenic lymphadenoid connective tissue.

DR. AMAND ROUTH said that he had seen several of such polypus growing from high up in the cervical canal where muscular and glandular tissues intermingle.

DR. HERBERT R. SPENCER said that these adeniferous fibroid polypi were not at all uncommon and he thought it a mistake to call them adenomata.

UTERINE FIBROIDS IN ADVANCED AGE.

DR. W. S. A. GRIFFITH related two cases of calcified fibroids which it had become necessary to remove on account of pressure symptoms, one in a patient of seventy-three, the other in a patient aged sixty-nine. In each case complete relief followed operation.

TUBAL MOLE ASSOCIATED WITH SARCOMA OF OVARY.

DR. GALABIN showed the left tube containing a mole and corresponding ovary (which was sarcomatous) removed together with the appendix of the opposite side from a woman of forty-six, who had had five children. The left ovary was nearly solid, but recent section showed a few very small cysts. He thought it probable that transperitoneal migration of the ovum must have occurred.

DR. FAIRBAIRN said that he considered that the specimen should be classed as a fibroma and not as a sarcoma of the ovary. He thought that there was ovum-bearing tissue on the outside of the tumor and, consequently, that there was no need to assume that transperitoneal migration of the ovum had taken place.

Annual meeting, Wednesday, February 7, 1906.

The President, W. R. DAKIN, M.D., F.R.C.P., in the Chair.

OVARIOTOMY DURING LABOR.

DR. HERBERT R. SPENCER recorded the case of a woman, aged 24, on whom he had performed ovariectomy during labor, when a little over eight months pregnant with her first child. The cyst had been tapped three weeks previously. At the operation extensive adhesions were found both to the abdominal wall in the neighborhood of the puncture and to the omentum at the upper part of the cyst. The tumor was a thin-walled cyst of the left ovary. It was multilocular and had ruptured at the lower part, allowing fluid to escape into the peritoneal cavity. Strong labor pains had set in an hour before the operation. After the operation was over the cervix was found to be fully dilated and the head low down in the pelvis. A female child weighing six pounds ten ounces was delivered by forceps, and the placenta a few minutes later. There was no post-partum hemorrhage. Mother and child recovered well, the mother suckling her infant.

Dr. Spencer strongly condemned the practice of tapping ovarian cysts unless they were undoubtedly malignant, or unless the patient be suffering acutely from some pulmonary affection or grave disease independent of the tumor. He discussed the treatment to be adopted when a woman is in labor with a large ovarian tumor which does not obstruct the pelvis. Owing to the dangers incidental to rupture of the tumor, such cases need prompt treatment. There are three alternatives: (1) To deliver by the natural passage, dilating the canal if necessary, and then to perform ovariectomy. (2) To perform ovariectomy, and leave the delivery to nature. (3) To perform ovariectomy at the end of the first stage of labor and immediately afterwards to deliver by forceps while the patient is under the anesthetic. In suitable circumstances the two operations might with advantage be performed simultaneously. Each of these three methods may properly be

performed, and possesses special advantages under particular circumstances—the first in avoiding the injurious effects of the anesthetic on the fetus, and the facilitating the operation of ovariectomy and the ligation of the pedicle; the second in avoiding the maternal and fetal injuries which are so common with instrumental deliveries; the third, of which the case here recorded is an example, in that the patient is delivered of her child and her tumor while under the same anesthetic. The ovariectomy can usually be performed with more complete asepsis just before delivery, and the risk of rupture of the large cyst during the expulsive pains is lessened.

DR. HERMAN said that he agreed with the main contentions put forward by Dr. Spencer.

RADIOGRAPH OF FETUS IN UTERO.

DR. HEYWOOD SMITH showed a radiograph taken in the thirty-sixth week of uterogestation. He considered that such photographs might prove of great service in determining the presence of twins, or varieties of presentation, besides any deformity of the pelvis.

CHORION-EPITHELIOMA.

DR. JOHN PHILLIPS showed a specimen removed by vaginal hysterectomy from a woman, aged twenty-one, on account of recurrent bleeding for three months following a hydatidiform mole. By digital exploration of the uterus a softish flattened swelling, the size of a bean, was detected high up on the posterior wall of the uterus. A small piece which was removed for examination proved it to be chorion-epithelioma. Some febrile symptoms occurred during the first fortnight after operation, but complete recovery followed. The patient has remained well for a year.

DR. CULLINGWORTH expressed the hope that the history of the case will be supplemented after the lapse of another twelve or eighteen months.

MR. MALCOLM mentioned that a case which he had reported in conjunction with Dr. Cuthbert Lockyer and Dr. Hamilton Bell was alive and well four years and seven months after the operation.

Annual Address.

The president (DR. DAKIN) then delivered the annual address.

Officers and Council.

The following list of officers for 1906 was taken as read:

President,

W. R. DAKIN, M.D.

Vice-Presidents,

MONTAGU HANDFIELD-JONES, M.D.

AMAND ROUTH, M.D., B.S.

WILLIAM JAPP SINCLAIR, Knt., M.D. (Manchester).

ALBERT C. BUTLER-SMYTHE.

Treasurer,

GEORGE ERNEST HERMAN, M.D.

Editor of "Transactions."

HERBERT R. SPENCER, M.D.

Honorary Secretaries,

ROBERT BOXALL, M.D.

ARTHUR H. N. LEWERS, M.D.

Honorary Librarian,

WILLIAM JOHN GOW, M.D.

REVIEWS.

DISEASES OF INFANCY AND CHILDHOOD. Designed for the use of Students and Practitioners of Medicine. By HENRY KOPLIK, M.D., Attending Physician to the Mt. Sinai Hospital; Formerly Attending Physician to the Good Samaritan Dispensary, New York, etc. Second Edition, thoroughly revised and enlarged. Pp. 885, illustrated with 184 engravings and 33 plates in color and monochrome. Lea Brothers & Co., New York and Philadelphia, 1906.

The new edition of this work has been brought thoroughly up to date. It opens with quite an extensive statistical and descriptive chapter on the anatomy, physiology and development of the normal child and on methods of examination and the management and therapy of the normal infant. It contains many thoroughly practical points. The chapter on infant feeding treats of the principles underlying the processes of nutrition and the metabolism of the nursing infant, and gives a description of the composition of breast milk under various conditions and of cow's milk and other substitute foods. This includes a discussion of the proper use of proprietary foods as auxiliaries. Breast feeding and artificial feeding are also described. If maternal feeding is impossible, the writer would favor artificial feeding rather than a wet nurse, with few exceptions. He simplifies the subject of percentage modification of milk as much as possible, figuring only upon the use of nine-ounce and sixteen-ounce top-milks. The physiology and diseases of the newborn are treated more fully than is usual in works of this class. The specific infectious diseases are very satisfactorily discussed, but so fully and with such frequent statistical references as to be of greater value to the physician than to the student. The important section on disease of the digestive system is very practical, and those on the affections of other systems are also satisfactory. The volume covers not only the subjects usually found in works on internal medicine but also

contains chapters on diseases of the bones, of the ear, of the nervous system and of the skin.

Throughout the book the writer frequently mentions cases in his own experience and bases his statements, as far as possible, upon his own statistics, quoting in addition those of others. This makes the work more suitable for use by the practitioner than by the average student. Statements of priority are fortunately few as they interest an equally small number. References for collateral reading are freely inserted at the ends of chapters. The work merits most hearty commendation as a careful review of the ideas of others combined with very definite expressions of individual opinion.

H. D.

MANUAL OF THE DISEASES OF INFANTS AND CHILDREN. By JOHN RULIVALI, M.D., Clinical Professor of Diseases of Children in the College of Physicians and Surgeons, Baltimore. Pp. 404, illustrated. Philadelphia and London: W. S. Saunders & Co., 1905.

The most difficult task in medical writing is to produce an absolutely complete text-book. That which most nearly approaches this and is by far the most thankless is to condense the subject to the irreducible minimum, yet to leave some meat in the shell. The present volume fulfills these requirements. Under infant feeding the student is given quite a latitude of choice methods of percentage modification of milk. Prescriptions are always considered a popular feature in works of this class, but the chapter on Therapeutics for Infants and Children in this volume is far more valuable than the ordinary lists of recipes. The standard remedies are sensibly discussed and the prescriptions suggested are well chosen. Many of the illustrations are of sufficient value to justify the space devoted to them. This cannot be said of the unnecessary addition of advertising pages to a book for pocket use.

H. D.

PRACTICAL PROBLEMS OF DIET AND NUTRITION. By MAX EINHORN, M.D., Professor of Medicine, New York Post-graduate Medical School; Visiting Physician to the German Hospital, New York, Pp. 64. New York: William Wood & Company, 1905.

This little monograph is a compilation of a number of the author's publications in various journals. The writer's views would appear to differ from those of the majority of physicians, who believe that the average human being consumes far more food than is required, as the expressed purpose for the publication of the volume is that it may promulgate the paramount importance of a sufficient nutrition. That this is not the case, however, is shown by perusal of the work, which deals largely with the treatment of those classes of patients who fear to aggravate their gastric disorders by taking food.

H. D.

URINARY ANALYSIS AND DIAGNOSIS BY MICROSCOPICAL AND CHEMICAL EXAMINATION. By LOUIS HEITZMANN, M.D., Second Edition. Pp. 319, with 131 illustrations. New York: William Wood & Company, 1906.

The second edition of this work consists of three parts. The first deals briefly with the chemical examination of the urine, giving only the common tests which do not require elaborate apparatus. In the second part, on microscopical examination, the writer describes the various crystalline and organic bodies and foreign substances found in the sediment. In the case of epithelium, for example, he states his belief that it is possible to differentiate lesions of various organs of the genitourinary tract by study of these cells. In the third and largest part of the book, that on microscopical urinary diagnosis, he describes the clinical features and those found in the urine in each condition. The work emphasizes chiefly the diagnostic value of the microscope in the examination of urine. The illustrations are in most instances diagrammatic.

BABY INCUBATORS. A Clinical Study of the Premature Infant, with Especial Reference to Incubator Institutions Conducted for Show Purposes. By JOHN ZABROSKY, A.B., M.D., Clinical Professor of Pediatrics, Medical Department, Washington University, St. Louis. Pp. 136. Illustrated. St. Louis, Mo.: Courier of Medicine Co., 1905.

This little work is practically a compilation of journal articles by the same author. It is based upon his practical experience with the incubators on the "Pike" at the St. Louis Exposition. In it are given a description of the building, incubators and all accessories, and of the technique of feeding, bathing, etc., a discussion of the management of pathological conditions, and conclusions as to the indications for the use of incubators and as to necessary precautions in their employment. These are drawn from a comparison of the writer's observations with those of other authors.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Version and Disengagement of the Arm.—Apfelstedt (*Berl. Klin. Woch.*, December 11, 1905) draws attention to the chagrin of the accoucheur who has performed version and delivers a dead child, or one with a broken arm. Both of these accidents are liable to occur in breech deliveries, on account of the arm becoming displaced and extending on the shoulder, as the body of the child is descending through the pelvis. When this takes place the delivery is retarded so as to sacrifice the life of the child, or the arm is fractured. This is due to a change in the attitude of the fetus during version, the child becoming limp, not from partial asphyxia, as might be supposed, but from changes in the muscular tonus of the child due to long delay in delivery. The normal tonus of the muscle being lost, the arm often becomes extended, instead of remaining against the chest. The prevention of this accident lies in combining with version the process of disengagement of the arm. The uterus contracts about the body of the child and would push the arm upward. The proper use of the internal hand in version is of the greatest importance, as well as which foot is brought down. In the first position the left hand enters the vagina, the right being placed on the fundus externally. The left ruptures the membranes, passes over the nearest shoulder, along the forearm to the elbow, seizes the arm so that elbow and forearm lie in the palm of the hand, and brings it down over the hip, extended, into the vagina, until it reaches a position of abduction. The corresponding foot is seized and brought down into the vagina, the right hand aiding these movements from without. Version is completed as usual.

Subcutaneous Hebotomy.—A. Duhresen (*Berl., klin. Woch.*, Dec. 4, 1905) finds in literature 115 cases of hebotomy, with six deaths. Of these, one death was from chloroform, one from typhoid, occurring twenty-five days after labor, the pelvis having healed perfectly, one from non-septic thrombosis of both spermatic veins, one from sepsis existent at the time of the operation, two from failures in technique, the wound becoming continuous with a rent in the vagina. The author believes that, when subcutaneous, this operation is a surgically correct procedure, as long as a communication with the vagina is prevented. By the use of surgical abortion, Cesarean section and perforation of the living child, great advances have been made, and symphyseotomy is needless. The indications for the operation are the existence of a conjugata vera of 6½–9 cm. in primiparæ, when after full dilatation of the cervix, and with good contractions the head does not become engaged, or when there

is danger to mother and child. In multiparæ, when contracted pelvis has caused the death of all previous children: here operation should be done as soon as dilatation is complete; if dilatation does not occur naturally it should be secured artificially. When version has been necessary to secure a living child, a prophylactic hebotomy should be done. The dangers of rupture of the corpus cavernosum of the clitoris in symphyseotomy, with its severe bleeding, or tearing of the ligamentum pubovesicalis, ligamentum arcuatum or transversum, and the muscles of the perineum by the head of the child, are all avoided by this method. There is no danger of sepsis when the operation is done subcutaneously, and an infirm oint is never the result, as sometimes occurs in symphyseotomy. Any hemorrhage from varices is easily controlled. The author believes it is better to anticipate the actual beginning of labor in the operation, and not to wait for absolute dilatation, lest delay destroy the life of the child, when the conjugata vera is much shortened. He believes that the operation can be made so simple that any general practitioner may do it in the home of the patient. Only three instruments are necessary: the saw, the blunt needle, and a knife to incise the skin at the point of entrance. The wounds of entrance and exit are quickly sealed by coagula, and need not be sutured. A firm bandage and rest on the back on a firm bed are all that are needed to secure firm bony union of the pelvis. The author believes that version should be preferred to forceps after hebotomy.

Prevention of Puerperal Fever.—Eduard Preiss (*Berl. Klin. Woch.*, October 16, 1905) states that mortality from puerperal fever in Germany is still of appalling frequency, in spite of the modern knowledge of asepsis and antisepsis. He believes this to be due to the custom of employing midwives. Many of these are from the lowest classes; they do all sorts of work, such as washing the clothing of the patient, and attending to the movements of the bowels. They wash their hands in a perfunctory way before making examinations, and dip them in a basin of water in which a few drops of carbolic or lysol are dissolved. This sort of cleansing is worse than none, because it gives a false sense of security. The hands are often soiled with the feces of the patient before the birth, and then examinations are made much more often than is necessary by way of the vagina. The author believes that the cure of this great evil lies in improving the education of the midwives, requiring a course of at least a year before allowing them to attend labor cases. As this will take some time, in the mean time he advocates the instruction of the public, especially of the lower classes. This might be done if every midwife was required to give her patient a circular preparatory to the case, which would state the dangers of soiled hands, clothes and bed clothing, the proper methods of cleansing of the hands, taking at least eight minutes, and the danger of too frequent vaginal

examination. He would also institute a system of honors for midwives, for good results in their deliveries, giving them an honorary title after a term of service properly performed, which they would be proud to earn.

GYNECOLOGY AND ABDOMINAL SURGERY.

Is Syphilis a More Serious Disease than Gonorrhea?—Alex. Doctor (*Zent. f. Gyn.*, Dec. 2, 1905) states that the venereal diseases are even more serious than tuberculosis and cancer, producing more suffering and more deaths. The immense number of cases of venereal disease should be taken into account in estimating the evil effects of disease. The gynecologist realizes that they are as frequently the cause of death as tuberculosis or cancer, although somewhat more indirectly. Gonorrhea produces disabling gynecological troubles that are worse than death, such as salpingitis, ovarian abscesses and pelvic adhesions. Extrauterine pregnancy often arises as a result of such troubles, by the adhesion of the tubes to the uterus or ovaries, loss of the ciliated epithelium, and purulent inflammations. Septicemia in pregnancy may also arise from the gonococcus. Venereal disease, whether recognized or not by the wife is the cause of untold family disagreements and sufferings. Childlessness and sterility add to the sorrows. Syphilis attacks 30 to 40 per cent. of the poorer classes; in England it is given as 80 per cent. Gonorrhea is even more frequent. The intelligent patient undertakes efficient treatment of syphilis, while he allows his gleet to go untreated as unimportant. The danger of these two diseases is great enough to enlist the fighting power of all physicians.

Cardiac Disease and Uterine Fibromata.—It appears to Charles Greene Cumston (*N. Y. Med. Jour.*, Oct. 28) that the action of fibroid tumors on the heart is very similar to that produced by the gravid uterus. Cardiac disturbances occur extremely frequently in cases of uterine fibromata; in quite a number of cases apparent symptoms are present, but in others all manifestations remain latent until after exertion or operation. All nervous patients afflicted by fibroids appear particularly predisposed to disturbances of the heart. It appears that anemia following hemorrhages is the most important factor in causing cardiac disturbances. In summing up the symptomatology of the heart disturbances that we have considered in this paper, we may say that functional lesions and organic lesions are the two great classes; palpitation and arrhythmia are certainly disorders, while anemic souffles indicate a very great change; but when the myocardium degenerates, either from brown atrophy or fatty degeneration, when the valves have lost their normal calibre, be it from either stenosis or dilatation, we are dealing with the bankruptcy of the heart, and all these conditions should be seriously taken into consideration by the surgeon when deciding upon an operation. All these cardiac con-

ditions considerably darken the prognosis of uterine fibromata; affections of the heart produce nervous troubles, hemorrhages, and surgical intoxications which may pass by unnoticed, but which will arise after the traumatism produced by hysterectomy. The prognosis depends entirely upon the extent of the pathological condition. Arrhythmia should not be considered as a formal contraindication to hysterectomy. When anemia has resulted in cardiac symptoms it would appear better to postpone operation and direct treatment to improving the general health. With a heart still weaker and the myocardium involved, operate at once before the heart muscle has become too much involved. With profound changes in the myocardium, whether due to brown atrophy or fatty degeneration, the question of operation becomes a very delicate one, and it should not be undertaken until all possible means to improve the heart condition have been tried. An excellent rule to follow is never to operate on patients presenting myocarditis and arterial hypotension.

Dysmenorrhea.—Gerry R. Holden (*Amer. Med.*, Nov. 4) draws the following conclusions from a series of ninety-five cases. Dysmenorrhea may be primary or secondary. In the primary form the pelvic organs are either normal or poorly developed. In the secondary form the following pathological conditions are present; these changes are the cause of the dysmenorrhea: (1) Pelvic inflammatory disease; (2) retrodisplacement; (3) myomas, especially the subcutaneous variety. Primary-dysmenorrhea often dates from debilitating illnesses and is often apparently caused by anemia, malnutrition and neurasthenia. In 40 per cent. of the cases with normal pelvic organs or those merely poorly developed successful results may be expected from dilation of the cervix and curettment. The prognosis is better in those cases in which pains (1) begin the day of flow or the day before, (2) are sharp in character, and (3) last but a day or two. The prognosis is worse where the pains (1) begin several days before the flow appears, (2) are dull in character, and (3) last for several days or throughout the flow. If the organs are not normal the prognosis is worse. When the history points to inflammatory trouble, even though none can be recognized at the ether examination, its possible existence should be carefully considered. If, in such cases, an exploratory laparotomy is not thought advisable, it is best to limit operative procedures to dilation of the cervix and omit curettment. In dysmenorrhea recurring after a period of relief following dilation and curettment, the possibility of the new appearance of a pathologic condition in the pelvis, *e. g.*, a retrodisplacement, should be carefully considered. When the pelvic organs are poorly developed, the prognosis for relief after dilation and curettment is much worse than when the organs are normally developed. Apparently maldevelopment of the pelvic organs causes dysmenorrhea. Chronic endometritis is rarely present in cases of dysmenorrhea unless there is at the same time an in-

inflammatory condition of tubes or ovaries. Chronic endometritis alone is rarely a cause of dysmenorrhea. Sterility is relieved by dilation and curetment in but 15 per cent. of the cases of sterile married women who are in the child-bearing period. The relief of dysmenorrhea does not necessarily mean the relief of sterility, and, the vice versa, sterility may apparently be relieved without relief of the dysmenorrhea.

Prophylactic and Therapeutic Value of Antistreptococcus Serum.—F. Fromme (*Munch. med. Woch.*, Jan. 2, 1906) describes the cases treated at the clinic at Halle in which antistreptococcic serum was used, both for prophylaxis and for cure of already established infections by the streptococcus, and gives us the conclusions at which he has arrived. Good results are to be expected in early streptococcus infections, in streptococcic endometritis, and in post-operative peritonitis if the serum be used soon enough. In post-operative peritonitis some cases get well without incision and drainage, but when they have been going on for some days incision and drainage become necessary in order to allow of the emptying out of the products of the infective process. The injections are valueless in pyemia and septicemia, especially in the puerperal state, and in all conditions of long standing in which there have formed abscesses and exudates, because a too severe reaction takes place in these cases. We need better knowledge of which streptococci are harmless and which are virulent, so as to know when the serum ought to be injected, and what cases will recover without it. In studying immunization with the serum we must take into account the virulence of the streptococcus, the resistant power of the individual, and other factors. Under prophylactic injections the author includes six cases, three of salpingo-oophorectomy with peritubal hematocele, two of total extirpation of uterus and adnexa for myomata by abdominal operation, and two by way of the vagina. All of them were cured without any rise of temperature or pulse frequency. They were injected three or four hours before operation with 10 c.c. of Menzers' antistreptococcus serum. The injections are painless and produce no reaction. Twelve cases of abdominal total extirpation for carcinoma were injected in the same way: nine of them recovered quickly without any reaction. One patient died some time after healing of the wound, of embolism of the lungs from thrombosis of both femoral veins. One other had a moderate peritonitis from which she recovered, and one died of peritonitis in spite of the injection. As a therapeutic measure the serum must be given as soon as the diagnosis is established, as we cannot hope for good results after the infection is well developed and deposits of pus and exudates have formed. In six cases of streptococcic endometritis injected the best results were obtained: these were confirmed by bacteriological examination, finding virulent streptococci in the vaginal secretions. A beginning infection with rise of temperature had set in, and

the reaction lowered the temperature at once and the infection went no further.

Relation of Hysteria and Other Functional Neuroses to Gynecological Troubles.—E. Meyer (*Monatsschr. f. Geb. u. Gyn.*, Jan., 1906) defines hysteria as a functional derangement of the brain powers in which directly or indirectly the psychical element plays the important part. Hysteroneurasthenia is a combination of symptoms of the two diseases. Cases of grave hysteria, with convulsions, paralyses, alterations of sensibility and stupor are comparatively uncommon. Most cases are of the moderate type. There can be no doubt that hysteria is much more frequent in the female than in the male; the neuropathic tendency and ancestry also are important predisposing causes. Chronic intoxication from alcohol, lead, etc., infections, especially syphilis, chlorosis and anemia, and wasting diseases are also causes. But the psychical causes are, after all, the most important: such as trauma and other mental and nervous factors. It cannot be denied that in many women with perfectly healthy genital organs the approach of menstruation or the climacterium, pregnancy, the puerperium and lactation determine peculiar nervous symptoms that are well known. Most cases of genital disease are accompanied by nervous symptoms. At the same time it is noticeable that the severest of these symptoms appear in those women who have the slightest complaints, such as endometritis and slight ulcerations and displacements, while those who suffer from severe pelvic inflammations, ovarian growths and cancer are not subject to the ordinary nervous symptoms. Of forty-two cases treated at the Königsberg Polyclinic, from April to October, 1905, for hysteria, neurasthenia and similar troubles, seven were affected with gynecological diseases; the gynecological treatment given them in no way benefited the nervous symptoms. Cases needing such treatment should receive it, but there is no good reason for treating every nervous case from a gynecological standpoint, whether it shows symptoms or no. The author concludes that in persons having no genital troubles, men and children as well as women, there may be similar symptoms which we call hysterical. These may be effected by genital diseases, but the most important elements in their causation are of a psychical nature. There is no ground for the theory that hysteria arises from a sort of reflex action or irradiation from various organs. Gynecological treatment seldom gives permanent good results in hysterical cases. The sexual organs and their diseases not only do not have much effect upon these neuroses, but many authors hold that the contrary is the case. At the same time hysteria often begins after sexual excess, or intercourse at the time of puberty.

DISEASES OF CHILDREN.

Enlarged Spleen in Children.—G. Carrière (*La Presse Méd.*, Sept. 20, 1905) showed a case of advanced rickets with

much enlarged spleen, as a text for the consideration of this condition in the various diseases of childhood. Enlarged spleen occurs in acute and chronic infections, in intoxications, nutritional troubles, liver diseases, heart affections, splenic diseases and blood diseases. Differential diagnosis must be made among all these affections in every case of enlarged spleen. The acute affections are easily diagnosed by their course, with fever and other characteristic symptoms. Syphilis is the most frequent chronic infection. In this we have the parental history, the eruptions and the malformations. Tubercular lesions resulting in enlarged spleen will cause fever, especially on a tuberculin test, and the blood formula will be different. Malarial spleen will be distinguished by its history and the finding of parasites in the blood. Among nutritional troubles that cause enlarged spleen the principal is rachitis. It occurs in 50 per cent. of cases. There may be tumors of the spleen of various kinds. If these are cystic, there is fluctuation and the enlargement is irregular. An exploratory puncture will be of value. In blood disease the normal blood formula will be changed. The prognosis is often grave and the treatment is unsatisfactory, except in acute diseases.

Palpable Kidneys in Children.—Otto Blun (*Berl. klin. Woch.*, Oct. 30, 1905) examined 106 children in the Augusta Hospital, as to the possibility of feeling the kidneys. In 37 cases one or both kidneys were palpable. The author thinks that he has demonstrated that displaced kidneys are much more frequent than is ordinarily supposed in children. The children were from 3 to 13 years of age, it being impossible to palpate successfully younger ones. They belonged to the children of the working classes, and many were poorly nourished, while all were more or less thin. There were 29 girls and 8 boys who had movable kidneys. In 16 cases it was the right, in 21 both kidneys that were movable. In 11 of these children albuminuria was present. In all these cases pregnancy was, of course, no etiological element.

Exophthalmic Goitre in a Child.—The case reported by Charles Batchelor (*Brit. Jour. Child. Dis.*, September) showed the first symptoms at the age of three years and one month, soon after a whooping cough. The eyes were prominent and the child had attacks of passion. When seen three months later there were exophthalmos, enlargement of the thyroid, frequent heart-action, and repeated attacks of passion, but no tremor. Six months after this she had influenza and pneumonia, but recovered. A few months later the exophthalmos increased; the pulse was 120 to 140, with marked pulsation of the carotids. Several illnesses occurred but were survived, but death finally took place from exhaustion after diarrhea, at the age of six years and four months.

Lymphatic Leukemia in a Child.—J. L. Morse and H. C. Low (*Bost. Med. and Surg. Jour.*, August 17) report a case under

observation for nearly eleven weeks. The child was three and a half years old. Until twenty-five days before death the diagnosis of lymphosarcoma or Hodgkin's disease was adhered to on account of the result of examination of excised nodes and of the fact that the white blood cells numbered only 16,000 to 34,000, while the mononuclear cells were 62 to 72 per cent. These increased to 91 per cent., and later varied from 76 to 90 per cent. Ten days before death the white cells were only 49,000, but the day before the fatal issue they reached 149,000. The writer believes that the only inference that can be drawn from the histological study of the lymph nodes at different stages of the disease is that lymphatic leukemia may have its origin in a malignant growth affecting the lymphoid tissues more or less generally, and that until there is a secondary proliferation of the lymphoid cells do we get the typical tissue picture and blood condition which is characteristic of lymphatic leukemia. It suggests that leukemia, pseudoleukemia and malignant lymphoma cannot be separated as three distinct entities, and that they do not always differ characteristically in the histological structure of their lymphoid tissues.

Albuminuria and Nephritis in Infancy.—Ernest Ballico (*Rev. di Clin. Ped.*, Oct., 1905) says that the common occurrence of renal alterations in babies is acknowledged, owing to the frequency of infective maladies, such as diphtheria and scarlatina. There is an incomplete evolution of the kidneys in young babies, and it is necessary that they should adapt themselves gradually to the demands of life. This functional evolution can be disturbed by various causes, especially by the too early administration of foods that are not adapted to the ability of the digestive organs. Arnozan has demonstrated a form of albuminuria due to the occurrence of kidney troubles and eclampsia in the mother, the toxic agents producing alterations in the kidneys of the child as well. The kidneys of the infant may also be affected by cold. Certain skin diseases produce albuminuria, due to the absorption of poisons from the cutaneous lesions, or to the medication. Albuminuria is much more frequent than has been believed. Of 250 babies, between two and nine months old, examined post mortem by Goulkewitch, 22 cases showed renal alterations, with hyperemia of the capillaries, leucocytosis in the glomeruli and canaliculi, necrosis, fatty degeneration of the cortical epithelium, and interstitial hemorrhages. Many cases attributed to dentition are really cases of kidney disease. Scarlatinal nephritis is very frequent. Next in frequency in infants is nephritis of diphtheria, then of measles and malaria. It may result also from dyspeptic troubles, especially when they cause eclampsia. In these cases albumin is abundant in the urine. Bronchopneumonia also is a cause of nephritis in infants. Scleroderma in infants is simply a form of subcutaneous edema of nephritis. There are renal complications in 23 of 70 infants under one year, seen by the author. There are many cases of nephritis in which albuminuria does not exist, and

hence a diagnosis cannot be made by chemical examination of the urine. In the author's cases there were four in which casts were found, while albuminuria was not present. Hence the importance in babies of a systematic examination of the urine, including the microscopical study examination.

Albuminuria in Infantile Tuberculosis.—Rodolpho Benati (*Rivista di Clin. Ped.*, Sept., 1905) tells us that albuminuria occurs in infantile tuberculosis more frequently than has been supposed. It varies much in severity, according as the tuberculosis is acute or chronic. In acute and subacute forms it is generally slight, while in chronic forms it is serious and permanent. The renal lesions may begin as mere congestion and go on to glomerule-nephritis, and end in large white kidney or in amyloid degeneration. The etiological factors are various: In some cases there is a mixed infection; in others there is an autointoxication arising from the gastrointestinal tract or other organs; again it is due to mechanical factors, such as disturbances of circulation; or it may arise from the condition of the blood or from tubercular cachexia. The author collected 111 cases seen at the Children's Hospital in Florence, between the years of 1892 and 1898, in all of which the diagnosis by physical signs was confirmed by bacteriological examination. In these cases tuberculosis was rare during the first two years, increased in frequency with age, and was most frequent from the fifth to the seventh year. Renal disease occurs most frequently in combination with tubercular meningitis, next in pulmonary and then in peritoneal tuberculosis. The author concludes that the disease is more common than has been supposed; that albuminuria is more liable to occur when the tuberculosis has become generalized or has attacked several organs, and when the condition has become serious, especially before a fatal issue. It occurs in 60 per cent. of cases of tubercular meningitis.

Relative Smallness of the Heart and Predisposition to Tuberculosis in Excessive Growth.—Ch. Bouchard (*Berl. klin. Woch.*, Nov. 6, 1905) says that in recovered cases of typhoid, where there is excessive growth it is of the skeleton alone, the organs remaining those of the child as he was when this abnormal growth commenced. The lungs, liver, kidneys are those of an earlier age, and out of proportion to the stature. There is a constitutional inferiority, an insufficient development of the arterial system. These young people are pale, easily fatigued, and succumb easily to disease; they are liable to tuberculosis, and the smallness of the heart is an important element in this predisposition.

Prevention of Stenosis of the Larynx After Intubation, and Secondary Tracheotomy.—H. von Ranke (*Munch. med. Woch.*, Oct. 17, 1905) states that various observers have noted cases of intubation in which, on account of serious lesions due to decubitus, it became necessary to do a secondary tracheotomy

to save life. In some of these cases the prolonged presence of the tracheotomy tube resulted in a stenosis of the larynx, which necessitated permanent wearing of the tracheotomy tube to permit of breathing. Some of these cases terminate fatally. The author in his case attempted to dilate the stenosed larynx with sounds, in preference to resecting the entire larynx, as was advised by Konigs. At first the results of dilation were good, but a permanent breathing space sufficient for respiration was not obtained after several months' time. In this case the child was able to breathe without the tube and canula for nine days, but severe dyspnea came on and a new tracheotomy had to be done. The author believes that this stenosis is not the result of the pressure, but due to allowing breathing to go on for too long a period through the tracheotomy tube, leaving the larynx without the customary stimulus of the current of air. The larynx is much more vulnerable during diphtheria than in a normal condition. Severe decubitus results in pus formation and ulceration of great severity, so that sepsis threatens death. Therefore something must be done to remove pressure and permit breathing. The author advises leaving the tracheal canula in place as short a time as possible, two to three days at most, and then removing it. If dyspnea returns the canula may be reinserted. Under this treatment he has had no further cases of stenosis.

Treatment of Bronchitis in Children.—J. E. Winters (*Med. News*, Nov. 25, 1905) emphasizes the importance of uniform room temperature of 72° F., sun exposure and open fire, free ventilation, with crib in the center of the room and protected from drafts; and light flannel clothing. In severe cases aconite is of unfailing efficacy, given in maximum, frequent doses during the first hours, in diminished and less frequent doses after four or six hours, and early abandoned when turgescence ceases. Sweet spirits of niter is the pre-eminent diaphoretic. This or citrate of potassium or spirit of mindererus may be used where aconite is not urgently indicated and should follow its discontinuance. These measures and intestinal elimination make up the febrifuge measures. Baths and coal-tar derivatives are contraindicated. Cold to the cutaneous capillaries conduces to extension. To diminish excessive secretion camphor, carbonate of ammonia, nuxvomica, oxygen inhalations, and counterirritation are employed. The writer advises a mixture containing about gr. iii of camphor in each spoonful, given every half hour. Carbonate of ammonia is a valuable adjunct, given in doses of gr. i., but this and nuxvomica may cause nausea. If the tubes are loaded with tenacious secretion a one-in-six mustard paste applied over the entire region where moist sounds are heard, left on twenty to thirty minutes and renewed every two or three hours, is invaluable. When the bronchi are flooded with secretions impetuous stimulation to relieve the feeble breathing is a great mistake. Active emesis repeated not more than

once or twice in the twenty-four hours is necessary. The child must be kept in the prone position to secure gravitation of secretions to a sensitive mucous surface so that coughing will not prevent refilling. Oxygen inhalations must be given continuously, even during sleep. To these are added mustard packs and maximum doses of spirits of camphor and carbonate of ammonia. Dietetic care and freeing from swallowed sputum so as to avoid fermentation and intestinal distention are obligatory. An efficient remedy for harassing cough in inflammation of the upper respiratory passage is an emulsion of castor oil. When cough is distressing counterirritation over larynx and sternum may be superadded in the form of flaxseed poultice with mustard sprinkled over its surface. In older children it may be necessary to employ a little iodine. In inflammation of the larynx, trachea or bronchi, aconite should always be to the fore. Steam inhalation increases susceptibility to cold, etc., and should never be used except for croup.

Leucocyte Counts in Pulmonary Diseases in Children.—Fifty such counts in cases of bronchopneumonia, lobar pneumonia and empyema are the basis of the conclusions of Henry Heiman (*Arch. of Ped.*, Oct. 1905) that there is present in bronchopneumonia of children a well-marked leucocytosis, independent of the amount of lung involved, and bearing no relation to the height of the temperature. The general rule is that failure of the leucocyte count to drop when the pulmonary signs disappear indicates either a complication or a fatal termination of the illness. A constant and considerable leucocytosis may regularly be expected in the lobar pneumonia of children, in about the same degree as in bronchopneumonia (bronchopneumonia, average in 19 cases, 33,900; lobar pneumonia, average in 24 cases, 31,700). The leucocytosis in lobar pneumonia differs from that in bronchopneumonia in that the white blood count is higher when the pulmonary involvement is greater. If in lobar pneumonia two or more lobes are involved a relatively high count may be looked for. The leucocytosis in lobar pneumonia is in no way related to the degree of temperature. An increasing leucocytosis is the general rule, reaching the maximum just before the crisis. While failure to drop before the crisis may indicate a complication, this may be of no special significance. The pre-critical drop is inconstant, of little or no prognostic value, and cannot be utilized as a means of determining the time of crisis. There is a high leucocytosis at the onset of empyema in children. In general, the diagnostic value of the leucocytosis in pulmonary affections of children is limited. It is of great aid, however, when resolution and the drop in the leucocytosis have occurred in lobar pneumonia and there are present signs that suggest the onset of empyema. Frequent blood counts at regular intervals, showing a sharp rise in the count, furnish strong presumptive evidence of a supervening empyema, providing other causes of leucocytosis can be excluded.

Hernia of the Lung in a Malformed Thorax.—M. O. Mace (*Bull. de la Soc. d'Obst. de Paris*, Nov. 16, 1905) presents a case of an infant who died some months after birth, in whom there was a malformation of the right side of the thorax, with absence of the third, fourth and fifth cartilages, leaving a defect in the wall that permitted of a hernia of the right lung. The mass disappeared during expiration and reappeared on inspiration, being especially prominent when the child cried. The pectoralis minor was absent, and the pectoralis major was developed only at its upper portion; the intercostals were also absent. The lung was covered by only a thin, transparent membrane under the skin. The other parts of the thorax and of the skeleton were normal. The only cause for the malformation that could be thought of was a possible fetal syphilis, the mother having had abortions before the birth of this child.

Variations in the Composition of Human Milk.—L. Deval (*La Presse Med.*, Nov. 18, 1905) has examined 161 suckling mothers, in order to determine the variation in the different constituents of the milk. Some of the specimens were from the nursing mothers at the Lariboisière Maternity in Paris, as well as from those who came to the daily clinics there; others were from country women. A quantitative examination for fat, casein and lactose was made in each specimen. As far as possible it was endeavored to obtain specimens from each nursing during the twenty-four hours. In other cases only a single specimen was examined. It has been noted that among all mammals some individuals have a richer milk than others, containing more fat. The influence of the nature of the food and the hygienic surroundings was noted, it being found that a meat diet increases the fat in the milk. A vegetable diet produces less cream. When the diet is insufficient the cream lessens at once; when a nurse leaves her own infant to nurse another, grief and ennui produce a slow but sure diminution of fat, casein and lactose; the amounts of fat and lactose increase with the age of the milk in the first month of lactation. These observations demonstrate the marked variation in the composition of the milk in different individuals as a result of psychical causes, changes in alimentation, etc. P. Planchon (*L'Obstetrique*, Nov., 1905) tells us that an excess of fat in the milk of mothers suckling healthy infants may cause serious gastrointestinal troubles, including diarrhea and vomiting. It produces a superalimentation which often results in eczema. An excess of albuminoids increases the fat. So do poor hygiene, lack of exercise, sitting at work, or a change of life from the country to a leisure life in the city as a wet-nurse, with an increase of rich foods. The increase of fat causes greater combustion and an increased production of heat in the infant's body, and the results are bad. The author has studied thirteen cases, from which he gives these conclusions: When the quality is richer and the quantity is diminished no bad results follow, while if

if the quantity is great and the milk rich the results are derangements of digestion. The remedy for too rich milk lies in experimenting until we find out how much milk the infant can digest, and limiting it to that amount; or we may lessen the amount of meat in the mother's diet; also the wine, beer and coffee, allowing her to drink milk and vichy and to eat soups, green vegetables, salads and preserves. Exercise every day, morning and afternoon, in the open air, must be insisted upon.

Digestion of Evaporated Cream.—T. Mojonnier (*Med. News*, Nov. 4, 1905) finds that the protein in evaporated cream digests a little more rapidly when treated with artificial gastric juice than does that of raw, pasteurized or boiled milk. The protein in evaporated cream precipitates in a fine, flaky condition, whereas that of raw milk is inclined to be more in the form of a lumpy curd. It is almost entirely soluble in artificial gastric juice. Its total digestibility by this method compares very favorably with that of raw, pasteurized and boiled milk. The small difference found was in favor of the evaporated cream. By means of natural digestion experiments with a child and with a man, the child was found to digest evaporated cream a little more completely than did the man. As a result of three experiments with each subject, it was found that in the case of the child only 3.31 per cent. and in the case of the man only 6.81 per cent. of the entire solid matter of the food remained undigested. Forster found 6.4 per cent. of the total solids of the milk of a nursing child to be undigested. The total digestibility of the protein in evaporated cream, after making correction for the metabolic products in the feces, in the case of the child was found to be 98.48 per cent., or very nearly what was found by means of artificial gastric juice, namely 98.89 per cent. With the man it was found to be 93.1 per cent. Both of these values are highly satisfactory for evaporated cream. The butter fat and milk sugar were both very completely digested and assimilated by the two subjects. The girl digested 98.80 per cent. of the fat and 97.78 per cent. of the sugar. The man digested 95.84 per cent. of the fat and 96.85 per cent. of the sugar. The child digested nearly 18 per cent. more of the mineral matter than did the man. The total energy or fuel value of evaporated cream is almost entirely available to the body. The child used 97.25 per cent. and the man 97.59 per cent. of the total energy contained in the evaporated cream which they digested. The health of both subjects was normal during the experiments. The child gained in weight, an average of about one pound a week during the three experiments, and relished its diet. The man lost in body-weight, but gained in protein during all of the experiments to the amount of nearly one-third ounce of protein per day. Evaporated cream, like other forms of pure milk, is an economical article of diet because its nutrients are practically all available to the needs of the body.

Use of Formic Aldehyde as a Milk Preservative.—From ex-

periments regarding the effect of formic aldehyde upon the action of rennin, the salivary digestion of starch and peptic and pancreatic digestion, Carstairs Douglas (*Scot. Med. and Surg. Jour.*, Nov., 1905) concludes that there is little to support the view that this preservative retards digestion when present in such proportions as from 1 in 25,000 to 1 in 50,000. He also believes that small amounts of this drug exert no appreciable influence on the analysis of the samples containing it. He feels that this preservative has been judged over-severely. While far from claiming that preserved milk is as good as fresh, he questions whether it would not be better to allow the use of certain preservatives than to permit the milk to arrive in cities teeming with bacteria, as it often does in summer, providing always that the nature and amount of such preservatives were clearly declared. If this were done he would favor the employment of formic aldehyde in such proportions as 1 in 30,000 and 1 in 40,000.

New Method of Preparation of Raw Cow's Milk for Children.—Concetti (*Riv. di Clin. Ped.*, Dec., 1905) describes a new method of preservation of cow's milk, which does away with the necessity of sterilization or pasteurization. He finds that the milk may be kept for some days in the laboratory without any preservative, provided that it is taken from the cow in a fairly aseptic manner. It need not be free from germs, since many of the non-pathogenic germs do not change the condition of the milk, and are harmless. Valgussa has invented an apparatus for taking the milk from the cow so that it is nearly aseptic. Siphons have been prepared in which the milk can be placed, instead of in the ordinary bottles. Carbonic acid gas has been found to be a good preservative: while not killing the bacteria, it inhibits their action and retards their development. This gas is injected into the milk in the siphons just as it is into a seltzer water bottle, and after five days the milk is found to be perfectly sweet. The biting taste of the carbonic acid gas soon passes off, and leaves the milk unchanged in its physical, chemical and physiological properties. The phosphates are rendered more soluble and the casein more digestible. This is an economical method of preservation, because the milk can be kept under pressure of the gas until it is needed for use, and none need be thrown away because the bottle has been opened and the milk exposed to the air. Neither is it necessary to divide the milk into quantities of the proper size for the number of feedings desired, and to keep it in separate bottles.

Etiology and Treatment of Noma.—Charles Herrman (*Arch. of Ped.*, Nov., 1905) believes that an organism corresponding to the streptothrix of Seiffert-Perthes is the one which plays the most important part in the etiology of noma. He considers it identical with that found by Plant, Bernheim, Vincent and others in the ulceromembranous lesions of the mouth, and also

with the spirillum sputigenum and spirochaete dentium of Miller, which are found normally in small number in the mouth and probably are different stages of development of the same organism rather than entirely distinct germs. This micro-organism is not a bacillus, but probably belongs to a family which serves as a connecting link between the bacteria and the protozoa, namely to the spirochætæ. This explains why it cannot be stained and grown on culture media by the usual methods. It is probably present in the atmosphere in the form of very resistant spores, which may be introduced into the body with food and water on which they are deposited. It is closely related to the bacillus necrosis found in the necrotic processes observed in some of the lower animals. In the human body this organism requires unusual and exceptionally favorable conditions for its growth and development. On this account noma is very slightly contagious. In order that a gangrenous process should result there must be a preceding physiological change in the tissue which renders it possible for the organism to penetrate, live and multiply in the apparently healthy portions. Ulcerative and gangrenous stomatitis represent different stages of the same process. The presence of diseased teeth undoubtedly plays an important part in the etiology of ulcerative and gangrenous stomatitis, partly by pressure and irritation, but primarily by producing a gingivitis, furnishing conditions favorable for the growth and development of the organism in question. In the infectious diseases of childhood particular attention should be paid to the condition of the teeth, and if diseased they should be removed. The more rational treatment of noma is the application of the Paquelin cautery, destroying not only the necrotic tissue but also the finer filaments of the microorganism, which have penetrated into the underlying apparently healthy tissue.

Pyloric Stenosis in Infants.—Among the recent contributions to the rapidly growing literature on this subject is a case reported by J. L. Morse and F. T. Murphy (*Bost. Med. and Surg. Jour.*, Nov. 2, 1905). At the age of two weeks the child swallowed a closed bib-pin, which was passed in a stool two weeks later. At about the time of the disappearance of the pin vomiting and constipation began. In spite of variations in the food vomiting continued, but was not characteristic of any special physical condition. The stools became small, dark, containing few curds and some mucus, finally no evidences of milk. Ten days after vomiting began a small mass was felt in the pyloric region; the lower border of the stomach was palpated just below the umbilicus, and there were visible peristaltic waves. The child died ten hours after a gastroenterostomy during which a smooth, rounded, dense, elastic, bluish-red tumor, about the size and shape of an olive, was found at the pylorus. Sections showed no evidence of previous ulcer, no pathological folds of mucous membrane, and no increase of connective tissue, but marked

hyperplasia of the fibers of the circular muscular coat. The case is said to show that symptoms do not necessarily begin at birth; that in complete or nearly complete pyloric obstruction operation seems to offer the only hope of recovery, and must be done before the infant is too much reduced by starvation. The peculiar meconium-like character of the stools may be of great diagnostic importance. J. C. Driffith (*Arch. of Ped.*, Oct., 1905) records a case which recovered after giving symptoms of pyloric stenosis. Born on December 25, 1903, symptoms of gastric indigestion appeared on January 10, 1904. On January 14 and for ten days thereafter there were frequent vomiting, signs of gastric dilatation, visible gastric peristalsis from left to right, and dark greenish or brownish viscid mucous stools with no fecal matter. On January 24 there began to be small but increasing fecal masses in the stools, with decrease of vomiting, which ceased on February 5, though there was still visible peristalsis. This remained active, with occasional return of vomiting and evidence of gastric dilatation. On May 1 signs of pyloric stenosis had disappeared. The writer feels that while 27 per cent. of cures are claimed for operative treatment one should not fail to think of the possible existence of a simple spastic condition which may recover under medical care. Operation must not, however, be deferred until the child is too weak. T. M. Rotch and M. Ladd (same) report a successful operation for congenital pyloric stenosis performed when the infant was three weeks old, and another case with autopsy after operation. They say that it must be recognized that a case of faulty feeding without any organic lesion may exactly simulate partial pyloric stenosis. Stenosis as a cause of vomiting is very frequent in comparison with the innumerable cases of severe vomiting not dependent upon organic disease. A case of pyloric stenosis in an infant only fourteen days old, successfully operated upon, is put on record by C. W. Townsend and C. L. Scudder (*Bost. Med. and Surg. Jour.*, Dec. 14, 1905).

Etiology of Summer Diarrhea in Infants.—G. Volpino (*Arch. per le Sci. Med.*, Vol. XXIX, N. 1) considers the bacterial element in the causation of summer diarrhea of infants. Such cases have been ascribed to the presence of bacillus coli communis, or bacillus lactis aerogenes. The author has found constantly in the feces of severe, as well as slight, cases a bacillus belonging to a species intermediate between bacillus coli and bacillus typhosus, which he calls bacillus enteritidis infantum. He made examinations of 18 cases of summer diarrhea of severe type, seen at Turin. The bacillus showed itself more virulent than bacillus coli communis to animals. Its constant presence, its pathogenic characteristics and its agglutinability with serum of babies sick with gastro-intestinal troubles show that it may be an important factor in the causation of summer diarrheas. This germ is not found in the feces of normal suckling infants, while in two cases of artificially fed babies, whose stools are always more or less abnormal, the germ was found.

Myotomia Congenita.—Comparatively few cases of this affection, known also as Thomsen's disease, have been recorded. Frank S. Meara (*Arch. of Ped.*, Nov., 1905) describes an instance of the condition in a boy ten years of age. The only incidents in the previous history were measles and pneumonia. The child was late in walking and stiffness of the muscles of the legs was first noticed at two years of age. The whole body was then "rigid," but there were no convulsive seizures. From three to six years the condition was worse than since. Examination showed unusual development of all muscles, and a stiffness accompanying the initiation of every muscular movement. This would pass off on continuance of the effort, recurring when motion was attempted after rest. The more haste in trying to make a motion the greater the difficulty in accomplishing it. Reflexes and sensation were normal. The reaction to faradism was a continuous tetanic contraction, and took place in response to a much weaker current than in the control cases. The muscles were easily excited by the galvanic current, as much response being obtained to 10 milliamperes as to 20 in the controls. Cathodal closure contraction was marked; cathodal opening contraction, negative; anodal closure contraction marked, but less than the cathodal. Response to closure of the current was slower than in the controls, but fairly prompt. On stroking the muscles with the current closed at the cathode a prolonged vernicular contraction was observed, continuing after removal of the pole. This was less distinct with the current closed at the anode. A sharp blow upon the muscles was responded to by vernicular contraction, the movement passing slowly like a wave along the muscle.

Congenital Umbilical Hernia.—C. G. Cumston (*Brit. Jour. Children's Dis.*, Dec., 1905) says that extirpation of the sac and suture of the freshened borders of the wound are sufficient in a large majority of cases. While several layers of buried sutures may be successfully inserted in the adult, they are far from easy of application in newly born children. Congenital umbilical hernia should be operated upon as soon as possible after birth, because a desiccated sac will soon become the starting point of inflammatory attacks in the viscera.

Tuberculous Bladder in Inguinal Hernia.—An unusual case of inguinal hernia is recorded by E. M. Corner and C. W. Rowntree (*Brit. Jour. Children's Dis.*, Dec., 1905). The chief feature was the presence in it of a diverticulum of the bladder with no trace of a peritoneal hernial sac, the case thus being a hernia of extraperitoneal type. The portion of bladder involved was removed and showed a typical round-cell infiltration with presence of giant-cells. The tuberculous nature of the lesion was proven by the subsequent occurrence of tuberculous peritonitis, which was cured by laparotomy.

Medical Affairs in the Arctics.—U. Senn (*Jour. Amer. Med. Assn.*, Nov. 25, 1905) after describing the conduct of labor

among the Eskimos, says that the mother carries the child in the hood of the fur jacket on her back, next the skin, with its head on a level with or a little above the collar of its mother's fur coat. All night the infant sleeps in the common family bed. The Eskimo women nurse their children until they are two or more years old. When they are three months old they are given blubber, small pieces of which are placed in the mouth and swallowed whole. In spite of such treatment the infantile mortality is small; the children are pictures of health and neither children nor adults show signs of rickets.

Temperature, Pulse and Respiration Relationships in Infancy and Childhood.—Making his observations upon children who were ill or convalescent, and not necessarily asleep or exceptionally quiet, but excluding all cases in which the disease might be expected to materially influence the pulse and respiration. M. Solis-Cohen (*Arch. of Ped.*, Dec., 1905) finds the following average rates in children with normal temperature during the periods stated: Birth to two years, pulse 122, respiration 30; 2 to 5 years, pulse 114, respiration 26; 5 to 9 years, pulse 103, respiration 25; 9 to 12 years, pulse 89, respiration 24. In febrile conditions he found the average increase of pulse-rate for each degree of temperature above the normal to be 4 in the first period, 5 in the third, and 7 in the second and fourth periods, as against 10 in the adult. The respiration-rate similarly increased 3 in the first period, $2\frac{1}{2}$ in the second, 2 in the third, and $1\frac{1}{2}$ in the fourth. The pulse-respiration ratio was, in general, 4:1 in children of all ages up to 12, and at all temperatures, except in children from 2 to 9 years of age with temperatures above 104° and infants under 2 years of age. In these it is 3:1 or 3.5:1.

Prophylaxis of Tuberculosis in Children.—Grancher (*Riv. di Clin. Ped.*, Dec., 1905) gives the conclusions arrived at by the International Congress of Tuberculosis thus: Tuberculosis is a contagious disease, and is contracted by children almost always in the family circle; in the adult it is often the result of an infantile infection, which has lain latent and unnoticed. The most important measures for defending the race against the disease is the preservation of the infant. Prophylaxis lies in preventing family contagion. Tuberculosis is more curable in infancy than at any other period of life. As prophylactic measures the house must be made healthy and dry; milk used for nutrition of the child must be sterilized; if there be tubercular persons in the family, the baby must be removed and hygienic measures instituted. In school the rooms must be well ventilated and lighted; there must be gymnastic and breathing exercises; cases of tuberculosis must be systematically sought after among the scholars by physicians, and the affected children treated at once by better food, open air classes and by removal to marine and mountain sanatoria.

Preservation of Children in Contact with Tuberculosis in the Family.—Heubner (*Riv. di Clin. Ped.*, Dec., 1905) states that tuberculosis occurs in 12 per cent. of the children of healthy families, in 43 per cent. of families in which one parent has tuberculosis. An unfavorable influence descends for one or two generations. One generation may be slightly scrofulous and may beget children that are markedly tuberculous. Marriage of all tuberculous persons should be prohibited, even if they have been completely cured for two years. A tuberculous mother should not nurse her children. The recent researches of Behring give the utmost importance to tuberculosis of the intestines, even if it be rare in nurslings. There may be infection by this method without anatomical lesions appearing immediately, there being a dissemination of bacilli to the lungs and bronchial lymph nodes where they may remain latent for a long time. Such a condition may be cured or may result in scrofula. From these considerations arises the necessity of the utmost care in the feeding and treatment of babies, especially soon after birth, and the popularization of knowledge with reference to the avoidance of every method of infection. Children of tuberculous parents remain normal provided that they are immediately separated from their parents, or the parents use every method of prophylaxis. If the mother be healthy she should have the care of the child; if she be infected the child should be given into the care of some other woman. Girls instructed in school become the best means of preventing tuberculosis.

Open-Air Treatment of Tuberculosis.—W. S. Halstead (*Amer. Med.*, Dec. 2, 1905) reports a number of interesting severe cases of surgical tuberculosis cured by open-air treatment. Without discussing the value of climate he emphasizes the importance for some patients of spending the entire twenty-four hours out of doors. This may greatly hasten the cure, and the advantages of a speedy recovery are obvious. A rapidly growing boy with tuberculosis of the knee-joint might lose a great deal in the length of the limb unless the cure were quickly effected. The writer has great confidence also in the efficacy of massage in the treatment of surgical tuberculosis. Most cases will recover without operation if they are given a fair opportunity in the open air. Tuberculin has never assisted the author in deciding when to discontinue fixation and to permit use of the affected joint. In no instance has he failed to get this reaction when crutches were about to be discarded, and in two individuals it was more prompt on release from the treatment than at its institution. C. G. Cumston (*Dublin Jour. Med. Sci.*, Nov., 1905) believes that while simple general treatment, including fresh air has occasionally been sufficient to cure tuberculosis in bone it is most dangerous in the large majority of cases to resort merely to this. He thinks that the results of the injection of 5 to 10 per cent. solution of chloride of zinc into the periost-

teum are most excellent, especially with extensive fungous arthrites, though it is very painful. When, however, it is necessary to suppress a tuberculous focus rapidly he strongly favors free incision, chiseling out of all the diseased bone, cauterization of the cavity with 5 per cent. solution of chloride of zinc, packing it with iodoform gauze, allowing free drainage, and immobilizing the limb.

Treatment of Tuberculous Conditions of the Spine.—De Forest Willard (*Ann. of Surg.*, Oct., 1905) says that complete methodical and long-continued fixation of the spine in the position of hyperextension, with healthy surroundings in the sunlight, are the prime factors in securing new ossific deposit necessary to replace the carious bone. Laminectomy for paraplegia is advisable only after treatment along the above lines from one to two years, since the prognosis, especially in children, under these conditions is favorable, and good powers of locomotion may be confidently expected. The operation is justifiable in selected cases where loss of motion and sensation are progressively worse and the symptoms threaten life. If the tubercular masses within the spine can be removed, and if extradural pachymeningitic deposits of pus can be taken away, improvement may be expected. The operation has a mortality of about 25 per cent. from immediate shock, 36 per cent. within a month; while one-half the cases die within the year, their lives being probably shortened by the operative procedure. Cases of non-improvement and death equal nearly 65 per cent. Forcible immediate straightening of the kyphosis is an unsurgical and dangerous proceeding; it is liable to reawaken the tubercular disease and to weaken the column. Forcible gradual straightening by supporting the kyphotic area upon a pedestal is a valuable agent in relieving deformity. The weight of the shoulders and pelvis can thus be utilized as straightening forces and the weight of the column thrown upon the posterior arches. In this position it is permanently fixed by plaster-of-Paris. Complete erasion of the carious bodies of the vertebræ is an uncertain operation; in the dorsal region requiring section of ribs, with danger of wounding the pleura. Wiring of the spinous processes has never been sufficiently tried to demonstrate its helpfulness. Spinal abscesses which contain only liquefaction of caseation should be aspirated. When true pus has formed, aseptic thorough drainage is advisable.

Application of Plaster Jackets for Spinal Caries.—In regard to the position of the patient during the application of the plaster jacket for spinal caries, E. G. Brackett and L. R. G. Crandon (*Bost. Med. and Surg. Jour.*, Nov. 9, 1905) says that lumbar disease improves under any method, but with the balance in favor of the hammock. Dorso-lumbar and dorsal disease shows a gradual increase by any method of extension that brings about a compensatory increase of the normal lumbar curve. High dorsal may be held by either form of dorsal sup-

port, provided the jacket is carried high in front. Care is necessary, however, to avoid postural defects. The ventral position is adapted for all cases of lumbar disease. It is also applicable to dorsal cases, when the portion covering the anterior chest is left until the patient is removed from the hammock, and the jacket finished in the sitting posture, with the patient held back in the extended position. The dorsal position is adapted to disease in either the lumbar or dorsal regions, but particularly to the dorsal. The fork is rather the more applicable to the dorso-lumbar and lower dorsal, and the rods to the higher dorsal cases. In the old cases with deformity care must be taken to avoid lordosis. The control of this by the flexed thighs is more apparent than real. The poise or balance in the standing position after the application of the jacket is a valuable guide and should be taken into account. The most accurate way of estimating the weight of the finished jacket is by the weight of the rolls before wetting. The shrinkage in weight is equal to about 9 per cent. of the rolls before wetting. A jacket of about 1 pound 12-14 ounces should be sufficient for a child of three to five years of age, and a jacket of 2 pounds 10 ounces' weight sufficient for a child of from ten to twelve years.

Gonorrheal Conjunctivitis.—H. D. Bruns (*New Orleans Med. and Sur. Jour.*, Nov., 1905) treats this affection in the infant by the free instillation of 10 per cent. solution of argyrol every fifteen minutes during the day and every half hour during the night. Pus is flooded out of the eye with the solution and wiped from the cheek with pledgets of moist absorbent cotton. This is continued for thirty-six to forty-eight hours; the intervals are then lengthened and applications of silver nitrate solution, gr. ss-v to the ounce, are made daily by the physician. The writer has abandoned the application of cold, save as a pain-relieving measure in adults.

Gonococcus Ophthalmia.—Charles H. May (*Arch. of Ped.*, Nov., 1905) says that the difference of opinion of various observers regarding the relative value of silver nitrate and organic silver salts such as argyrol may be explained by a failure to consider the indications for such. The organic salts of silver are indicated in the early stage of the conjunctivitis, while there is a profuse discharge, as the use they subserve is the destruction of the gonococci. In this germicidal action they are just as efficient as silver nitrate, equally penetrating, and cause no irritation or pain; hence they can be used much more liberally and frequently than the nitrate. To be efficient, however, the solution of protargol or argyrol must contain from 25 to 50 per cent. of the remedy. The solution of nitrate of silver, on the other hand, answers an entirely different purpose. After the stage of purulent secretion has subsided and the conjunctiva presents the well-known papillary appearance, a 1 per cent. solution of nitrate of silver is indicated, not as a germicide, but as a stimulating agent, to bring the mucous membrane back

to a normal state of smoothness. In this stage, applications of the stick of sulphate of copper will accomplish the same result.

Typhoid in Children.—W. J. Butler (*Four. Amer. Med. Assn.*, Nov. 11, 1905) says that milk diluted with water is the best diet for children suffering from typhoid. Albumin water is also suitable, and barley water and rice water are useful supplements to milk. Ice cream is at times well borne; at others the intestinal symptoms become more marked. Diet during the early part of convalescence is of great importance. The writer would not increase the liquid diet until the temperature has been normal for ten days. While a rectal temperature of 103.5 or 104 is the usual indication for the employment of tub baths, they should be given when it is much lower if there are marked nervous symptoms. The author gives the first bath at 90°, gradually cooled to 80° or 75°, the bath lasting ten to twenty minutes. The number of tubbings in twenty-four hours is apt to be overdone. A child with typhoid requires rest. In cases of intense intoxication high enemas of two to eight ounces of normal saline solution every four to six hours aid by increasing elimination, especially renal. The use of intestinal antiseptics has not seemed to be of value in any of the writer's cases.

Relationship of Parenchymatous Goiter to Rheumatism in Children.—In thirteen consecutive cases of children with parenchymatous goiter, J. R. Clemens (*Arch. of Ped.*, Oct., 1905) obtained a strong past history of rheumatism antedating the earliest recognition of the goiter by the parents, besides evidences of present rheumatism. The patients were from eight to twelve years of age; twelve were girls. The goiters were first noticed between the sixth and tenth years, before the time at which hypertrophy of the thyroid gland, associated with puberty, might be looked for.

Impetigo Herpetiformis in a Child of Eighteen Months.—Th. Kügler (*St. Petersb. med. Woch.*, Nov. 26, 1905) details a case of impetigo herpetiformis, an extremely rare disease, said to occur mostly in pregnant women. The child suffered from fever, rapid pulse and eruption on the genitals, and appeared very ill. The scrotum, penis and three fingers' breadth of the inguinal region were affected by the eruption, which consisted of small, round bullæ, among which were some minute pustules, with cloudy contents. The skin was bright red about them, and in concentric rings were dark red, bluish red, brownish-blue circles. Three days later the condition was much worse, the temperature was 41.2 C. The surface of the skin was all separated from the cutis, internal organs were normal. The child died. Only twenty-nine cases of this malady have been recorded in literature.

THE AMERICAN
JOURNAL OF OBSTETRICS
AND
DISEASES OF WOMEN AND CHILDREN.

VOL. LIII.

MAY, 1906.

NO. 5

ORIGINAL COMMUNICATIONS.

PUERPERAL ECLAMPSIA.*
STATISTICS OF COLUMBIA HOSPITAL.

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THERE is no subject in the whole range of obstetrics that is of more vital importance or absorbing interest than that of eclampsia. Its unknown cause and unsettled pathology render the treatment necessarily, to a considerable extent, empirical. The most generally accepted theory of its etiology is that of a toxemia, and its early recognition and management along this line have been productive of the best results. I present for your consideration this evening a summary of the cases occurring in the last 2,035 confinements in Columbia Hospital, and hope we may be able to draw deductions of practical value from its clinical and pathological findings. A very large percentage of the cases were admitted in labor, so that the urinary examinations prior to the onset of the convulsions are wanting, but in nearly every instance a history of the preeclamptic phenomena was obtained. Of those that

*Read before the Washington Obstetrical and Gynecological Society, February 2, 1906.

were in the hospital before the attack a more complete history is given; they show a relatively lower mortality, because of the advantage of a definite and prompt treatment. In all there were twenty-eight cases of eclampsia, so that there was one case of eclampsia to each 72 confinements.

Color: White, 14, or 50 per cent.; black, 14, or 50 per cent.

Age: Oldest, 44; youngest, 16.

Primiparæ, 21; multiparæ, 5; not given, 2.

Time of occurrence: Ante-partum, 16, or 57 per cent.; intra-partum, 7, or 25 per cent.; post-mortem, 3, or 10.5 per cent.; not given, 2, or 7 per cent.

Greatest number of convulsions, 56; least, 1.

Earliest during pregnancy, 5 months' gestation; latest after labor, tenth day.

Presentation: Cephalic, 26; breech, 1; not given, 1.

Admitted in labor, 18; in hospital before convulsion, 9; not mentioned, 1.

Premonitory symptoms present in 23; not present in 3; not mentioned in 2.

Method of delivery: Artificial, 15; natural, 13; abdominal Cesarean section, 1; vaginal Cesarean section and forceps, 2; induction of labor and forceps, 1; manual delivery of breech, 1; forceps, 10.

Manual dilatation, 3; rubber bags, 3.

Venesection was practised in 2.

Puerperium normal, 10; morbid, 18; of the normal, in 5 obstetrical intervention was practised, and 5 were natural births; of the morbid, 7 were due to infection (temp. above 100.5°); gonorrheal cystitis, endometritis, and pneumonia, 1; mastitis, 1; 2 were natural deliveries, and 7 instrumental.

Mortality, maternal, 7; 7 infants died within three days; unknown, 1; 7 still-born.

No. 1. Primipara. High forceps; indication, inertia and three convulsions; died on seventh day of septic peritonitis.

No. 2. Admitted in labor, one convulsion. Venesection, salt solution, morphia and chloral. Lived twenty-four hours. Died of edema of lungs.

No. 3. Multipara; admitted in labor; natural delivery, twins, still-born; convulsions. Treatment: morphia, nitroglycerin, digitalin, etc. In labor fifteen hours; died one and one-half hours after

delivery. Autopsy, dilatation of heart and passive congestion of kidneys.

No. 4. Primipara. In hospital; pains regular and strong; early rupture of waters; duration of labor eight hours; five convulsions before delivery; thirteen after; died forty hours after confinement of edema of lungs.

No. 5. Multipara. General condition bad, anasarca, headache, dyspnea, etc. Given infusion of digitalis, citrate of lithia, citrate of caffeine, also chloral per rectum at bedtime. Seventeen hours after admission had a convulsion; a rapid breech extraction was made, followed by hemorrhage from laceration of cervix, which necessitated gauze packing. The tampon was removed at the end of six hours, when the hemorrhage recurred and required re-packing. Patient never rallied; died of exhaustion thirty-six hours after delivery.

No. 6. Primipara. Admitted in labor. Attempt made to deliver per vaginam unsuccessful owing to contracted pelvis. Abdominal Cesarean section performed. Died thirty-six hours later of edema of the lungs.

No. 7. Primipara. Admitted in labor; natural delivery four hours later; had four convulsions, but, in spite of the morphia, venesection, and hot bath, she succumbed to edema of the lungs some hours after delivery.

When it is considered that at least two-thirds of these cases were admitted in labor, and many after the onset of the convulsions, a number of them having been previously examined and treated before admission, these figures certainly compare very favorably with those from other sources. It will be observed that the percentage is about equally divided between the white and black races, and our experience shows that race is not a necessary factor in the disease. Eighty per cent. occurred in primiparæ.

As to the time of the onset, it will be seen that the greatest number were antepartum. While this does not agree with most authorities, it is supported by the history of the cases.

As a rule the convulsions ceased after the evacuation of the uterus, or were less severe, though in one case there were 49, and in another 12 seizures after delivery; both were terminated by artificial cervical dilatation and high forceps, and recovered, while a third had 13 following a very natural delivery, and succumbed.

It is seldom that antepartum convulsions fail to precipitate labor, but in this series there are two cases which are exceptions;

the first, admitted to the hospital May 30, 1904, had two convulsions on June 3, and under the influence of morphia, veratrum viride, free purgation and colonic irrigation with normal salt solution, the eclamptic symptoms subsided. On June 8 she had another slight seizure. Very easy birth, July 12. Fifty-one hours after labor had three convulsions, but the attack yielded to sedative and eliminative measures, and the patient left the hospital several weeks later, still having a trace of albumin in her urine. The other case was admitted to the hospital January 25, 1905. Had had two convulsions before admission; salutary effect from morphia, purgation and colonic irrigation was obtained for a few days; then as the symptoms gradually assumed a menacing character, labor was induced at the eighth month with Reynolds bag and delivery effected with forceps. Recovery was uneventful. In both cases the infants survived.

Albuminuria seldom is absent preceding the eclamptic attack. This condition was obtained in two cases of the series. Both were in the hospital several weeks before delivery, and repeated urinary analyses were made, the last, in one of the cases, of a specimen obtained just before the seizure, with negative results; constitutional symptoms were also wanting. Immediately after the convulsion a catheter specimen showed marked presence of albumin and granular casts. Ewing says the disease may be far advanced before albuminuria appears.

The morbidity, like the mortality, is high.

In some cases there is fever accompanying the convulsions, the temperature ranging from normal to 102, depending upon the number of seizures and virulence, and gradually subsiding in several days, provided there is no infection. Not infrequently, however, faulty technique and forcible hasty delivery through an undilated cervix result in laceration of the parturient tract, and favor hemorrhage and infection. Rarely insanity is a sequel to the disease, and this happened in one case. The patient was a primipara, who gave birth to twins after a natural labor. Shortly following delivery she became maniacal and had to be placed in an asylum. At the end of two months she had fully recovered.

When the pregnant, parturient or puerperal woman is attacked with convulsions the natural presumption is that it is a case of eclampsia. Ordinarily, the diagnosis of eclampsia offers little difficulty, but care must be exercised to exclude epilepsy, hysteria, meningitis, alcohol and opium poisoning, apoplexy, etc.

Headache, disturbance of vision, insomnia, precordial distress and vomiting, together with edema, particularly of the face and upper extremities, associated with high arterial tension, albuminuria, diminished excretion of urine and urea afford an array of signs and symptoms that may be regarded as almost pathognomonic. Rarely its development is so rapid that the premonitory manifestations may be absent or so slightly marked as to be overlooked. Again, we sometimes encounter cases which are very insidious in onset. The patient is listless, apathetic, with anorexia and some nervous twitching, and gradually lapses into a state of profound coma, which may end in death. These different types quite likely depend upon the degree of virulence, or it may be that there are several kinds of intoxication of pregnancy, just as there are varieties of puerperal infection.

Bacon regards albuminuria, together with edema, as of the greatest value in diagnosis, while Davis considers the deficient excretion of urea the safest urinary guide. Our experience is that the daily output of urea, instead of being 30 to 40 grammes as given in the text-books, is more apt to be 15 to 20 grammes, and we have frequently seen it as low as 5 grammes without any untoward result. The urinary findings are unsatisfactory and of secondary importance, in the absence of clinical evidence. Their association, however, is of great value, and their persistence, in spite of active measures, is a valuable index of the gravity of the disease, and one which calls for the termination of the pregnancy or labor.

Edsall says that the diminished excretion of urea late in pregnancy may be due to the retention of nitrogen for the purpose of building up the tissues of the fetus; to the fact that the woman is taking very little nourishment; or, perhaps, that excretion is poor. It is absolutely impossible, in any particular instance, to tell which is the case. He has seen women that were perfectly normal vary in their nitrogen excretion from $3\frac{1}{2}$ to 16 grams. Expressed roughly, in terms of urea this would mean from about 7 grams to over 30 grams. These women were on the same diet and did not vary greatly in the amount of food they took.

The prognosis of eclampsia is grave. About one-fourth die. Tarnier places the maternal mortality at 30 per cent., and the fetal at 25 per cent. Olshausen gives 25 per cent. maternal mortality and 28 per cent. fetal. Löhlein, from statistical data, places the maternal mortality at 19 per cent. At the Baudelocque Clinic, Paris,

from 1893 to 1900, 24.5 per cent. of the mothers who suffered from eclampsia succumbed, and 32 per cent. of the infants perished. In the Columbia Hospital, from January 1, 1900, to December 31, 1905, the maternal mortality was 25 per cent. The time of onset, number and character of paroxysms, and degree of virulence will greatly influence the result. Eclampsia occurring during gestation or labor is more fatal than when it has its inception postpartum.

The temperature curve is an element of importance in prognosis. When it is high, and instead of diminishing, rises progressively, it is of grave omen. Hypothermia is likewise of serious augury.

The pulse is also a valuable criterion. When it is full, and strong, and below 100, a favorable outcome usually results; if, however, it is weak, rapid, over 130, and increasing in frequency, with deepening coma, the case is likely to prove fatal.

Pulmonary edema, pneumonia, cerebral hemorrhage and nephritis are the immediate causes of death in the majority of cases.

After a cessation of twenty-four hours the attacks are not likely to return (1 in 15 only, Olshausen). A low temperature, lightness and infrequency of the convulsions, and absence of anuria are signs of a favorable termination. Recovery may be complete or partial. In the latter instances intellectual torpor, feeble memory, aphonia, or diminution of vision may persist for days or weeks after the cessation of the attack.

The fetal mortality is even greater than the maternal. If eclampsia supervenes during pregnancy, premature labor occurs in a large proportion of cases. Some infants die in utero, followed usually by a subsidence of the toxemia, while in many instances the fetus survives and is delivered living at term.

The death of the fetus in utero is caused by disturbances of hematoses during the attack, or by the toxemia. The fetus may be born alive and die subsequently of congenital feebleness, hemorrhage or convulsions. Postmortem examinations of fetuses dying of eclampsia have revealed visceral lesions, particularly in the liver, very similar to those observed in the maternal organs.

Zweifel has aptly termed eclampsia the disease of theories. Certainly, from the number offered to explain its etiology, it is deserving of this distinction.

As is well known, the toxic substances found in the economy

under ordinary circumstances, leaving out bacterial and ptomaine poisoning, come from three principal sources: the food, intestinal fermentations, and catabolic changes of cell nutrition (disassimilation).

The toxic substances introduced in the food are principally mineral constituents containing potassium. So far, however, as these substances are concerned, pregnancy does not increase or diminish their effect, except, perhaps, as regards constipation, which prevents intestinal elimination, and may favor their absorption.

The production of toxic substances within the alimentary canal is not disputed. Besides the direct demonstration of these substances by several experimenters (Stich and others), it has been shown that urinary toxicity is in part related to chemical changes which go on within the intestinal canal. Intestinal putrefaction may, as it were, be predicted by the discovery of certain products in the urine: indican, compound phosphates, unoxidized sulphur compounds, etc. Experiments have shown that urinary toxicity diminishes or increases according and in proportion to the diminution or increase of fermentative processes in the intestine.

The constipation, which is so common an occurrence in pregnancy, may be properly invoked as a factor in favoring the fabrication of toxic products in the intestine. On this account alone constipation is considered sufficient by some to produce eclampsia.

But of all sources from which poisonous substances may be supposed to accumulate within the organism, disassimilation of cells themselves is the most important. In the pregnant woman less oxygen is absorbed and carbonic acid eliminated than under normal conditions (Andral, Gavarret). From this circumstance it may be assumed that intricate processes of cellular oxidation are subnormal. Glycosuria and increase of adipose tissue are, therefore, relatively frequent in pregnancy. The glycosuria may be imputable, under certain conditions, perhaps, to the disturbance of the functions of the liver, which normally stores up sugar in the form of glycogen, and which, on account of fatty degeneration, induced by pregnancy, it may be unable to retain.

The fetus also has been implicated as a possible source of elaboration of certain substances which may dialyze through the placenta and thereby enter the circulation of the mother. The placenta itself has been incriminated (Lettule). The absence of menstruation during pregnancy is alleged to favor the accumula-

tion in the organism of substances which normally are eliminated by that extravasation. A series of arguments exists then to prove that in the pregnant woman the poisons elaborated by the organism are increased in amount.

May it be also proved that this accumulation is partly due to defective elimination? The question may be answered in the affirmative.

It is well known that albuminuria is quite frequently observed during pregnancy. Sometimes it is due to special causes outside of the kidney, but very often it is primarily dependent upon some alteration of this organ. A diminution of urinary toxicity has been demonstrated in pregnancy (Van der Velde, Boix), from which fact it might be assumed that defective renal elimination exists in that state. Experimental investigations might also be invoked to prove that besides defective renal elimination, there are also deficient intestinal, biliary, cutaneous, and even pulmonary, elimination.

Besides the previous two hypotheses to account for the accumulation of toxic substances within the organism of the pregnant woman, a third factor may likewise be invoked, and that is defective destruction of toxic material. It is clear that, theoretically, toxic substances may accumulate within the organism, if the ordinary processes concerned in their destruction are deficient. The organism is normally provided with a variety of means to accomplish this end. Among the chief to be mentioned is the liver, which is intimately concerned in destroying and rendering innocuous the poisonous substances elaborated within the body. But the liver during pregnancy undergoes certain modifications which tend to diminish this toxilytic function. In the first place, a certain amount of fatty infiltration of the liver cells occurs during pregnancy (de Sinety) which may naturally be supposed to interfere with the integrity of its physiological action. Furthermore, glycogen accumulates in the cells of the liver during pregnancy (Charrin), and in such proportions toward the end of the period of gestation as to offer an obstacle to the normal functioning of the hepatic parenchyma. Besides the alterations of the liver above mentioned, to account for a possible diminution of its poison-destroying power during pregnancy, the intestinal mucosa, spleen, thyroid and suprarenal-gland, other organs concerned in defense of the organism against toxic substances undergo alterations which are sufficient to undermine the influence of their protecting action.

The post-mortem findings in eclampsia are varied in character and affect many organs. Certain authors have described disseminated hemorrhagic and necrotic foci present in the liver and in some other organs (kidneys, brain, etc.) as the constant pathological lesion of eclampsia (Virchow, Schmorl, de Jurgens, Pilliet, Saint Blaise, Stone, Ewing, Williams, and others). The lesions in the liver, according to Stone and Ewing, are identical in eclampsia, yellow atrophy of the liver, and pernicious vomiting of pregnancy. Williams takes exception to this view, and contends that there are at least two toxemias of pregnancy, and probably more, one due to yellow atrophy and the other to eclampsia, and he bases his contention upon careful study of the pathological anatomy, clinical study and metabolism in these two conditions. In both, necrotic lesions occur in the liver, but these differ in character in the two diseases.

He states that in eclampsia the lesions begin in the portal spaces and invade the lobule from the periphery towards the center; while in the vomiting of pregnancy and acute yellow atrophy of the liver the necrosis begins in the center of the lobule and spreads towards the periphery and never involves the portal spaces.

Renal lesions are almost always found in autopsies upon eclamptics, the most common being an acute nephritis with necrosis of the epithelium of the uriniferous tubules; they are, however, inconstant and varying, and are no longer regarded as the essential substratum of the disease.

Various pathological changes have also been described as affecting the nervous, respiratory, and circulatory apparatus, including edema, thrombosis, hemorrhage, etc., none of which are characteristic.

The hepatic changes, however, are so characteristic and constant that many modern observers believe them to represent the primary lesions of eclampsia. They are attributed to an impairment of hepatic cell function, as the result of a gravidic auto-intoxication, reaching the liver by the portal vein, and carrying some chemical or septic poisons, elaborated, perhaps, in the intestines.

However divergent the views regarding the curative treatment of eclampsia may be, there is universal accord concerning prophylaxis. It consists of hygienic, medical and dietetic measures. Good pulmonary ventilation, nourishing and easily digested food, frequent bathing, moderate exercise in the open air, proper cloth-

ing, the avoidance of fatigue and exposure to cold are the principal hygienic measures to be employed.

The frequency of eclampsia could be greatly diminished if more careful supervision of the pregnant woman was exercised. The perfunctory examination of the urine for albumin, during the latter weeks of pregnancy, is not sufficient; the total amount of solids excreted in twenty-four hours should be ascertained. The constitutional signs and symptoms must also be closely scrutinized. When intoxication exists, as manifested by slight digestive disturbance, headache, etc., the regulation of the bowels and restriction of the diet will usually suffice. Persistent headache, vertigo, uncontrollable vomiting, disturbance of vision, insomnia, neuralgia, showing involvement of the nervous system, will call for more vigorous and active measures. Free purgation, hot baths, absolute milk diet, and rest in bed should be enjoined. Diuretics are of secondary importance, and of little use until the bowels and skin have been freely acted upon.

The medical treatment will vary according to the indications of the individual case. If there be preexisting cardiac disease, or chronic nephritis, remedies appropriate for these diseases should be used. In the former, digitalis, strophanthus, strychnia and other heart tonics are serviceable, while in the latter, nitroglycerin is of inestimable value. In the acute nephritis of toxemia our chief reliance should be upon free catharsis and diaphoresis. Mercurials followed by salines, hot-air or plunge baths followed by envelopment in blankets, rectal injection of salt solution, frequently repeated, citrate of lithia and caffeine and an abundance of water are the agents that have proved very successful in our hands.

If, in spite of vigorous treatment, the volume of urine is not increased, and the excretion of urea remains stationary or diminishes, together with persistence of menacing constitutional symptoms, it will be necessary, particularly if the fetus is viable, to terminate the pregnancy.

While there is much difference of opinion regarding the therapeutics of eclampsia, elimination, sedation and safe delivery are the methods of procedure to be considered. As to the first and second there is general accord, differing only in matter of detail; concerning the third, however, there is decided lack of unanimity. Some advocate treatment along medical, dietetic, and hygienic lines, contending that forcible delivery is not justifiable; while

others demand that immediate delivery should invariably be undertaken in the interests of the mother and child. There is still a third class, who, while not agreeing with the conservative policy of the former, or the radical methods of the latter as a routine measure, utilize both according to the exigencies of the case. The writer favors the combined method of treatment.

Croton oil and elaterium are preferable during the attack, because of the ease of administration and rapidity of action. Where the patient is able to swallow, the saturated solution of magnesium sulphate should be given to further eliminate the poison from the bowels. Rectal or colonic irrigation with normal salt solution, is a rational measure; it permeates the tissues, diluting the toxins, and promotes elimination by the skin and kidneys. The subcutaneous injection should be restricted to cases of threatening or actual collapse. When the arterial tension is high, edema marked, and kidney function much impaired, it is contraindicated, as it is capable of doing harm by increasing the blood pressure, and, perhaps, intensifying the renal insufficiency. The hot-air bath, when well borne, is also very beneficial. Its prolonged use, however, is inadvisable, as it may cause great depression. The wet pack may also be used, but it is not as efficacious.

Chloroform, morphia, chloral, veratrum viride, nitroglycerin, and venesection are the remedies that we have used to control the convulsions. I formerly believed chloroform to be the sovereign remedy, but experience has markedly changed my views. Given at the time of the convulsion, when there is a tendency to asphyxiation, it aggravates the difficulties by interfering with the supply of oxygen. Further, it is a cardiac depressant, and as this organ has already undergone degeneration, and the blood contains other toxic material, this, together with its deleterious influence on the renal functions should restrict its administration to the time when intervention is necessary. Chloroform masks the horror of the picture, but in quieting the symptoms is apt to add fuel to the flames.

I am firmly convinced that the practice of giving anesthetics continuously or intermittently, extending over a period of some hours, adds to the inherent gravity of the disease and is largely responsible for the high mortality.

Morphine and chloral hydrate are the two principal antispasmodics, and may be used separately or combined. Our preference has been for the morphine, hypodermically, on account of the cer-

tainty of dosage and rapidity of action. It is nerve sedative, relieves the spasm and reflex irritability, and diminishes salivary and bronchial secretions. It has little effect upon the heart and kidneys, except, perhaps, in chronic nephritis.

While eclamptic subjects show great tolerance for morphine, as much as $3\frac{1}{2}$ grains being given in twenty-four hours, the patient should be carefully watched for possible idiosyncrasies. In one of the above cases $\frac{5}{8}$ of a grain produced marked physiological effect, reducing the respirations to 12 per minute, the condition persisting for several hours, even after delivery by vaginal Cesarean section, and in another, one-fourth of a grain of morphine caused alarming symptoms, slowing the respiration to six per minute.

Chloral hydrate is a very valuable remedy, but the drawback to its employment is its possible rejection when given by mouth, or expulsion when administered by enema. We have used it with happy effect in the prodromal stage, and also after delivery. It should be given in large doses, preferably by enema, in milk, as watery solution is apt to produce rectal tenesmus.

We have found veratrum viride to be very effectual in reducing the tension, and frequency of the pulse, but as it was never used alone it is impossible to pass upon its complete therapeutic value. As it acts by depressing the heart, the patient should be kept in a recumbent posture to guard against syncope.

Nitroglycerin also reduces the arterial tension, equalizing the blood pressure and promoting diuresis, and we have found it of especial value when these results are desired following the delivery.

Pilocarpine, being a cardiac depressant and favoring edema of the lungs, one of the dangers of eclampsia, should not be used.

Venesection is considered by many competent observers to be a heroic but almost specific treatment of the malady. It not only reduces the blood pressure, but also diminishes the quantity of toxins in the blood. It is particularly valuable in cases where the pulse is full and bounding, and where cyanosis is threatening, with edema of the lungs. It was practised in two of the cases, both fatal. But as these were in a moribund state upon admission, they were not fair tests as to its value.

The simultaneous transfusion of salt solution is recommended and practised by eminent authorities, but since it keeps up the blood pressure, one of the principal dangers of eclampsia, it is of questionable value.

However different may be the opinions of the authorities as to the degree of interference allowable, the facts that convulsions cease after delivery, or are mitigated in severity, and that the mortality is lowest in post-partum eclampsia (7 per cent.), are arguments in favor of the evacuation of the uterus as rapidly as may be consistent with the integrity of the lower segment.

The following statistics show that in fifteen cases, intervention was practised as follows: forceps, 10; abdominal Cesarean section, 1; vaginal Cesarean section and forceps, 2; breech extraction, 1; induction of labor and forceps, 1; with a mortality of 20 per cent. One of these, a high forceps case, died on the seventh day of septic peritonitis, and the other had been exhausted by hemorrhage from deep laceration of the cervix, caused by too rapid extraction, so that faulty technique was largely responsible for the result. Of thirteen natural births, four, or 29.74 per cent., succumbed: three to edema of the lungs, and one to cardiac and renal disease.

The result in a given case will depend upon the severity of the attack, the judgment and skill of the physician, and rigid observance of asepsis. Essential to any success in the treatment, is a well-thought-out plan of prompt but not over-zealous procedure, based on the various phases of the disease combined with a knowledge of the condition of the cervix and the changes which it must undergo before pregnancy can terminate or be terminated.

When the cervix is soft and yielding, the convulsions are lessening in frequency and severity, the coma not profound, the pains regular, excellent results can be hoped for from the medical treatment by morphia, chloral veratrum viride, etc., combined with eliminative measures. In hydramnios and multiple pregnancies, puncture of the membranes will relieve the pressure, and may, in conjunction with the above remedies, suffice. If necessary, after complete dilatation of cervix, the delivery may be accelerated by forceps or version, depending upon the position of the head.

When the cervix is undilated and rigid, or the internal os is not effaced, the balloon of Champetier de Ribes, the webbed bags of Reynolds or Vorhees may be used with good effect, provided time is not a necessary element, as in impending eclampsia, but on account of the slowness and uncertainty of their action they cannot be relied upon during the convulsions. Likewise the manual method of Harris, or bimanual of Edgar, and the instru-

mental, as obtained by the dilator of Bossi or its modification, are not advisable in these cases, unless in skilled hands, and even then there is great danger of extensive laceration of the cervix and lower segment of the uterus, with possible hemorrhage and subsequent infection. It is in this class of cases that multiple incisions of the cervix and vaginal Cesarean section, or hysterotomy, and the classical Cesarean section have been advocated.

Halbertsma (1878) recommended abdominal Cesarean section for eclampsia, and Hillman has reported thirty-nine cases with a maternal mortality of 51.3 per cent., and fetal of 43.9 per cent.

This certainly is not more favorable than the other methods of intervention, and hence has met with little support.

Multiple incisions are of value when the external os is effaced; when it is not, they are fraught with danger, because of the likelihood of extension of the incisions by tearing, during extraction, on account of insufficient dilatation. Vaginal Cesarean section is preferable in this class because it provides ample opening of the cervix to permit immediate extraction. I have recently reported two cases of this series successfully treated in this manner.

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SOME CLINICAL OBSERVATIONS ON THIRTY-SEVEN CASES OF ECLAMPSIA.*

BY

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It is not my purpose to-night to discuss the etiology, pathology or treatment of eclampsia. The medical journals throughout the country are full of theories concerning this disease. The best pathologists, chemists, and clinicians are continually at work on it. And no one claims to have solved the riddle as yet.

I simply wish to give you a brief picture of a series of cases of eclampsia which have been under my observation during the last thirteen months, and to give you a few clinical notes concerning them. I report these cases through the courtesy of Dr.

*Read before the Society of the Alumni of St. Vincent's Hospital, October, 1905.

E. B. Cragin, in whose service, at the Sloane Maternity Hospital, they occurred.

1. The first case which I will mention is Mrs. K., an Irish primipara, 32 years old, six months pregnant. For one month she had noticed headache and black specks before the eyes. Thirty-six hours before admittance she had a convulsion, and others followed in rapid succession to the number of fifteen. On admittance she was blind, skin yellow, conscious, urine scant, dark, boiling solid.* and full of casts. Cervix soft, admitting tip of finger. By means of bags, cervix dilated, and in two hours an accouchement forcé was done, with still-born child. No improvement followed delivery. There were no further convulsions, but only about 3i of urine a day was voided, very low in urea (gr. 1—3i). Patient more stupid and yellow, hemorrhagic petechiæ over body, dying on the eighth day. No autopsy was allowed. (This is an example of marked anuria and jaundice of the fatal hemorrhagic type.)

2. Mrs. G., a Russian Jewess, 32 years old, pregnant for the seventh time, seven and a half months pregnant. Her first four labors were normal. In the fifth, five years ago at Sloane, she showed marked toxic symptoms. In the sixth, three years ago, the labor and puerperium were normal. In this pregnancy there were no symptoms till four days before admittance, when headache, vomiting, dyspnea and edema developed. Four hours before entering the hospital, blindness and delirium developed. Pulse was found of slight tension, cervix soft, admitting tip of finger, urine 20 per cent. albumin. Two convulsions while being prepared. Accouchement forcé at once done, a premature child, which subsequently lived, was delivered. (3 2-16 lbs. at birth, 5-3 1-2 lbs. on 127th day.) No improvement followed delivery. Kept under chloroform, a doctor sitting by her bedside all night. Convulsion followed by convulsion through the night at about half hour intervals. Morphine had little effect. Chloroform tended to produce edema of lungs, and could not be given freely. Temperature rose to 105° F., and patient died 10¾ hours after delivery, with edema of the lungs. Total number of convulsions was eleven.

*Urinalyses are mentioned only in briefest way. Percentages are given in volume by gravity, not in weight (gms. per litre) as in hospital records. In all cases, except where specially mentioned, granular and hyaline casts were found. For the sake of brevity, mention of these has often been omitted. In all cases countings of the white blood cells were made. These were almost uniformly higher than normal, much more so in the severe cases. Mention of these has also been omitted.

(This, like Case 1, a severe type, rapid onset, growing worse after delivery, with convulsions which could not be controlled.)

3. Mrs. B., was a stout II-gravida, 30 years old, six months pregnant; shortly before admittance had two convulsions. Entered hospital irrational and with no reliable history. Patient was found stupid, with tense pulse, cervix long, not dilated (tip), and urine boiling solid, and full of casts. By bags and accouchement forcé delivery was accomplished in 11 hours. Child still-born. Patient did not improve rapidly. There were no further convulsions, but marked restlessness and abdominal distension, which steadily increased; vomiting of blood on fifth day; urine was voided about 3xx a day. Patient finally recovered, convalescence being delayed by a pleurisy with effusion. Discharged on the 48th day in good condition. (A very severe type, with two bad symptoms, vomiting of blood and marked abdominal distention.)

4. Mrs. S., aged 30 years, V-gravida, a large, stout woman at term, had suffered from headache and edema through whole pregnancy. A sudden convulsion ten hours before admittance and two more soon after. Patient found stupid, face pale, pasty, edematous. Pulse slight tension, urine boiled solid, cervix fully dilated, breech presenting. Patient rapidly delivered of healthy child. Hemorrhage of 28 oz. occurred from a retained placenta. There was immediate improvement after delivery. Urine voided in large amounts, clearing rapidly. Discharged 18th day, urine showing only trace of albumin. (This is a type moderately severe, showing immediate improvement after delivery.)

5. Mrs. K., private patient. A young primipara, aged 24 years. Through whole pregnancy seemed in perfect health, and had been carefully watched by a very competent doctor. Only once did the urine show a trace of albumen. Entered hospital ten days overdue, the picture of health; urine showed trace of albumin, but no casts. Labor induced as child seemed large. Severe headache developed during labor, thought to be due to quinine given to promote pains. Patient suddenly became stupid and delirious. A few moments later a typical convulsion occurred. Cervix was at this time four fingers dilated. This was dilated manually, and a high forceps operation performed. Head large and hard and child still-born. Patient in collapse. Revived by intravenous injection of 1200 c.c. of salt solution. Recovery good, with no further convulsions. Pulse after reaction from shock of high tension and

rapid. Three doses of veratrum viride (m \ddot{v} . of the fluid extract) at intervals of four hours caused it to drop to 64 from 130. The urine after convulsion showed 20 per cent. of albumin and a few casts. This cleared up rapidly, a trace only on the third day, and no casts after the fifth day. Patient discharged in good condition on the 38th day, being delayed by a mild sapremia, due to a piece of retained chorion. (This case is interesting, as there were practically no premonitory symptoms till just before the convulsion, and the patient had been under careful observation during the whole pregnancy. Also patient was overdue and delivery at term would probably have been normal. Recovery was rapid after delivery.)

6. Mrs. C., a IV-gravida, 30 years old, at term. Three previous pregnancies normal. During present pregnancy no toxic symptoms present except rather excessive vomiting. Labor began normally. Five hours before admittance a sudden convulsion, followed by four others, occurred. On admittance patient was in stupor, urine boiled solid, cervix soft and dilated three fingers. Rapid delivery by medium forceps. There were two convulsions shortly after labor. Patient was in stupor for three days, passing large amounts of urine, albumin only a trace fourth day. Discharged sixteenth day with baby, urine showing trace of albumin and no casts. (A typical case, very ill, with speedy recovery after delivery.)

7. Mrs., C., 20 years old, I-gravida, at term. Apparently had no symptoms before labor. Trace of albumin, but no casts found. Had been in hospital several days, when in first stage of labor suddenly found in stupor. Brought to the operating room and immediately had a severe convulsion. Cervix then dilated three fingers. An accouchement forc \acute{e} was done, with living child. Urine after convulsion showed 15 per cent. albumin and casts. Recovery uneventful. (This case showed practically no premonitory symptoms.)

8. Alice B., a negress, 22 years old, I-gravida. Pregnancy said to be normal. Entered hospital in second stage of labor. Urine not examined before delivery. Delivery normal, 7½ mos. fetus. Fifty minutes after labor patient seized with eclamptic convulsion. A second one three hours later. Urine post-partum 8 per cent. albumin and casts. Recovery uneventful. Baby on second day had a convulsion in incubator and died. Autopsy showed, in the liver, degeneration and atrophy of liver cells, with extravasa-

tions of blood. In the kidneys, parenchymatous degeneration, the same lesions found in adult cases of eclampsia.

9. Mrs. R., a white III-gravida, at term, 25 years old. For last few months slight headache with edema of legs noticed. On day of admittance sudden vomiting followed by three convulsions. Brought to hospital stupid and nearly blind, urine boiled solid, cervix soft, admitting four fingers. An immediate accouchement forcé done. Mother's recovery uneventful and rapid. Baby did only fairly well, and on thirteenth day died suddenly. Autopsy showed degeneration of liver and kidneys and cerebral hemorrhage. (Here also are seen the characteristic lesions of eclampsia in the baby. Death due to cerebral hemorrhage, probably.)

10. Mrs. F., I-gravida, 20 years old, eight months pregnant, gave indefinite history of kidney trouble. No symptoms other than slight headache and vomiting at times during pregnancy. A severe vomiting fit, followed on next day by another, quickly succeeded by two convulsions. On admittance pulse rapid (140), high tension, patient in coma, urine boiling solid. Cervix soft, admitting two fingers, accouchement forcé one hour after admittance. Living child born. Mother made rapid recovery. No further convulsions. Discharged eighteenth day with only trace of albumin and no casts. (Rapid recovery after delivery.)

11. Jennie L., 18 years old, I-gravida, 7 months pregnant, single was well until three weeks before admittance; since then slight headache. Twelve hours before admittance a sudden convulsion, followed by twelve others. One more in ambulance, and fifteenth as patient was wheeled into the examining room. Patient in deep stupor, pulse slow, of slight tension, albumin a trace, with many casts. Cervix rigid, long, not dilated. By bags and bougies cervix dilated to admit three fingers in ten hours. As no fetal heart sounds could be heard, a version followed by a craniotomy was performed. Recovery was rapid, but patient was entirely irrational for seven days. Discharged 27th day, sane and in good condition. (Case interesting from the large number of convulsions, 15, the temporary insanity and the rapid recovery.)

12. Mrs. R., aged 28, I-gravida. Eight months pregnant. All through pregnancy headache, vomiting, edema; 21 hours before admittance a convulsion, and others through afternoon and night, 12 in all. Then brought to hospital in deep coma, urine 20 per cent. of albumin, pulse 100, marked tension, face puffy, cervix rigid and

not dilated. No fetal heart sounds. By bags, cervix dilated in seven hours to admit two fingers. Then accouchement forcé and craniotomy. Recovery rapid. Marked dementia for 3 days. Discharged 20th day. (This case interesting as an instance of marked neglect. Symptoms for eight and one-half months, with a doctor in attendance. Convulsions for 21 hours before being sent to hospital. In spite of this, the rapid recovery after uterus emptied, with insanity for three days.)

13. Mrs. P., a poor old negress, aged 38, V-gravida, 6 months pregnant. Indefinite history of vomiting and edema. Two days before admittance a convulsion. Sent to Roosevelt Hospital, where she was received in almost dying condition. Revived by intravenous infusions. Transferred to Sloane, pulseless, deep coma, urine heavy, trace of albumin and many casts. Cervix long, rigid, not dilated. After use of bags and dilators for 18 hours, cervix admitted two fingers. A vaginal Cesarean section was then performed. Recovery slow. Patient complained of much pain over whole body for days. Discharged twenty-eighth day. (This was an early case—six months—and very severe case. Cervix could not be dilated by usual methods in any reasonable time, hence vaginal section.)

14. Ida S., a negress, 18 years old, I-gravida, eight months pregnant. Practically no premonitory symptoms. Seven convulsions in quick succession, just before admittance. Urine one-half solid by boiling, and full of casts. Cervix soft, admitted two fingers. By bags and accouchement forcé, delivered of living child in three hours. Recovery rapid, marked only by a mild puerperal infection. Discharged twenty-third day.

15. Mrs. P., aged 29 years, I-gravida at term, was seen several days before admittance. Then gave marked toxic symptoms, headache, nervousness, spots before the eyes, and marked edema and albuminuria. Patient absolutely refused to stay in hospital, but promised to return early in the morning. After three days she returned, feeling better, but with edema very marked. Put to bed and on treatment, but during the night had a convulsion. Cervix soft, admitted three fingers, urine 12 per cent. albumin, no fetal heart sounds. By forceps patient delivered at once. Still birth. No further convulsions, and for two days patient seemed to be doing well, voiding 37 and 64 oz. urine each day, but low in urea. On third day passage of urine stopped and patient became comatose, with vomiting of blood, pulse rapid and weak (140);

saline infusion gave only temporary relief. In spite of stimulation pulse grew weaker and lungs filled up, patient dying at end of third day. (This is a sad case, for the patient might have been saved had she come to the hospital when first seen. There was marked anuria, and the vomiting of blood marks the severe type of disease.)

16. Anna H., a negress, 19 years old, II-gravida, seven months pregnant, came to hospital in apparently good condition. While talking to the doctors had a convulsion. Cervix soft, admitting two fingers, urine boiled one-half solid. Delivered in four hours by bags and accouchement forcé. Child still-born. Mother in fair condition. No improvement after delivery. Urine voided in small amounts, very low in urea, not over 20 grs. a day. On third day, delirious and stupid, crying out in pain. Death on fourteenth day, patient wasting away to mere skeleton. Autopsy showed typical lesions, with no evidence of sepsis, although patient ran marked temperature for last four days. (This case illustrates the rapid onset, the scanty urine low in urea, and lack of improvement after delivery.)

17. Mrs. S., aged 21, I-gravida, six months pregnant, did not speak English, and no previous history obtained. Three convulsions before delivery. Cervix not dilated, urine one-third solid on boiling, with many casts. After sixty hours by bags, cervix soft enough for accouchement forcé, Braxton Hicks' version and craniotomy. Improvement rapid till fifth day, when a sudden convulsion occurred, preceded by a vomiting spell. No further convulsions, and recovery after this uneventful. (Early onset, sixth month, sixty hours from convulsion to delivery. Rapid recovery with convulsion on fifth day.)

18. Mrs. McF., aged 18, I-gravida, at term, was in the hospital six weeks before delivery, apparently perfectly well. Urine never showed casts of albumin. Labor easy with low forceps. In good condition after labor. Child normal. Ten hours later a convulsion, with a second two hours later. Convulsions preceded by vomiting. Urine after convulsions showed albumin, a heavy trace, with many casts. Recovery after this was uneventful. (This is an unusually interesting case, as pregnancy was entirely normal, urine was normal, and after labor patient seemed perfectly normal till the vomiting immediately before convulsions.)

19. Margaret F., aged 20 years, I-gravida, single, at term. Presented no symptoms during pregnancy except edema for last

month. Admitted with marked edema of legs, and heavy trace of albumin. During labor had one convulsion. Delivered by low forceps. Recovery rapid. Child lived. (Probably the excitement of labor and entering the hospital were powerful factors in causing this single convulsion.)

20. Mrs. Ph., I-gravida, aged 28, eight months pregnant. For two months feet and hands swollen, worse in last two weeks. Had felt well till day of admittance, when began to vomit. Convulsion six hours before admittance, second one four hours later. On examination urine boiled three-quarters solid, with granular and hyaline casts. Cervix long and rigid. After thirty-seven hours cervix was dilated two fingers, but still too rigid for delivery. Condition of patient bad, so vaginal Cesarean section was done. Baby living, four pounds. Died, thirteenth day, after many convulsive twitchings. No autopsy allowed. Mother had no more convulsions but facial twitchings. For three days stupid with fair pulse of slight tension. Vomiting of blood and great abdominal distention occurred. Temperature and pulse began to rise. Uterus washed out but found clear. Pulseless all fourth day, not responding to stimulation. Intravenous infusions given twice with temporary improvement, but heart finally gave out, lungs filled up, and patient died at end of fourth day. No autopsy. (A severe hemorrhagic fatal type, rapid onset, with a cervix which could not be dilated.)

21. Mrs. C., an American, VII-gravida, 32 years old, seven months pregnant. Past health good. Previous pregnancies normal. For one month headaches and vomiting spells. Three convulsions one and a half hours before admittance, when urine boiled one-half solid, and many granular and hyaline casts, patient in deep coma and cervix long and dilated to admit one finger. No. 2 bag inserted and seven hours later a precipitate labor occurred. Child living (weight 3 11-16 lbs. Discharged 102d day weighing 6½ lbs.) Mother did not improve. In coma for two days; two slight convulsions directly after labor. On second day suddenly stopped breathing. Artificial respiration effectual. Eight hours later again stopped breathing suddenly, and could not be revived. Hemorrhagic spots over body. Urine very scant. Eleven and one-half ounces in twenty-four hours with trace of albumin. No autopsy. (Severe hemorrhagic fatal type, voiding small amount of urine.)

22. Cynthia J., a negress, I-gravida, 20 years old, seven months

pregnant, with syphilitic lesions. For last three weeks headache and vomiting, especially marked for last few days. Severe convulsions shortly before admittance. On admittance trace of albumin and granular casts, deep coma, rigid cervix. Vaginal Cesarean section done. Child premature, dying in 24 hours. Mother died on twenty-fifth day, after lingering illness, wasting away, delirious; periods of collapse when entirely pulseless, and revived by intravenous infusions of salt solution. Uterine cavity clean, no pelvic mass, cervix sloughed badly, temperature ranging from 102° to 104° F. Urine voided in large quantities, urea normal and albumin and casts disappeared. No autopsy allowed. (Patient seemed to die of sepsis or syphilitic mixed infection rather than from eclampsia.)

23. Mrs. T., I-gravida, 25 years old, seven months pregnant, with no reliable history. Sent to hospital after two convulsions, semi-conscious with marked edema of legs and under eyes, urine boiling solid. Cervix long and rigid. After trying for twenty-four hours to dilate cervix with bags, an accouchement forcé was done, from two fingers' dilatation. Deep tear in right side resulted, which was repaired with chromic gut. Child still-born. Mother sent to ward in fair condition, but did not improve. No further convulsions, but twitchings occurred frequently. Stupor developed. On third day vomiting of blood, edema of lungs; pulse became imperceptible and death occurred. Patient voided plenty of urine with considerable amount of urea. (This is an example of severe hemorrhagic fatal type, showing no improvement after delivery.)

24. Cora M., a young single girl, I-gravida, 17 years old, at term, came to hospital apparently in fine health, no history of toxic symptoms, trace of albumin, but no casts. Labor was normal. Twelve hours later patient suddenly turned over in bed, called out "What's that!" and had a convulsion lasting four minutes. Pulse became rapid and of high tension. No further convulsions, but twitchings frequently seen. Fell into coma, gradually deepening, breathing became more and more labored. On fifth day vomiting of blood, petechiæ on body, abdomen much distended. Died on sixth day, heart giving out. Patient was bled twice, infused, given hypodermoclyses, colon irrigations, all to no purpose. Urine voided in large amounts, urea nearly normal, albumin trace, and a few casts. Autopsy showed typical liver and kidney changes. No signs of sepsis. (A severe hemorrhagic

fatal type of post-partum eclampsia, few premonitory symptoms.)

25. Mrs. I., aged 26, I-gravida, 7 months pregnant, came to hospital after having had two convulsions. For one month there had been edema, with specks before the eyes for two weeks, and for last few nights a choking dyspnea. Urine boiled one-half solid. Cervix soft and dilated to admit one finger. By bags and accouchement forcé delivery accomplished in four hours. Child still-born. Improvement was immediate and rapid. Discharged on twenty-eighth day, albumin a trace, and no casts. (A mild case, with rapid improvement after delivery.)

26. Mrs. S., a stout I-gravida, seven months pregnant, aged 26 years. Edema noted for two months. Three hours before delivery eight convulsions in rapid succession. On admittance in stupor, urine one-half solid by boiling, cervix not dilated at all. After trying for ten hours to dilate cervix with bags, an accouchement forcé was attempted. This failed, and a vaginal Cesarean section was done. Child still-born. Mother's condition after operation only fair, pulse weak and rapid. Six hours later patient seemed better, when suddenly, after chloral gr. xxx by rectum, pulse suddenly failed and lungs filled up with edema, patient dying in a few moments, in spite of stimulation. (This case shows a very rapid onset and sudden death, with no improvement after delivery.)

27. Mrs. H., private patient, III-gravida, 24 years old, eight months pregnant, had eclampsia two years ago. Entirely well since, till present pregnancy. At fourth month had two convulsions, and two weeks before admittance two more. Patient suffering from specks before the eyes, and an almost unbearable headache. Patient kept on treatment for two weeks, so as to get, if possible, a viable child. Symptoms growing worse at that time, persistent vomiting and headache severe, labor was induced; child lived. After delivery relief was immediate and striking, no more vomiting or headache, and urine was normal after the second day. (This case is interesting from the early appearance of the convulsions, fourth month, and the almost miraculous disappearance of the symptoms after delivery, with delivery of viable, healthy child.)

28. Mrs. S., a I-gravida, 30 years old, at term, came to hospital with marked general edema, and urine half solid with albumin. Had suffered for one month with headaches and edema. There were no fetal heart sounds. Patient seemed to be in fair con-

dition. Put on treatment, but nine hours later had a convulsion. Cervix admitted two fingers. By bags and accouchement forcé and craniotomy delivery in seven hours. Patient grew worse after delivery. Stupor developed. Pulse rapid and tense (not affected by veratrum veride). Early the next morning the lungs began to fill up. Dry cupping, venesection, oxygen and adrenalin given and breathing improved, but pulse grew weaker and patient died twenty-nine hours after delivery, vomiting blood just before death. No autopsy. (A very rapid case, of hemorrhagic severe type, growing worse after delivery.)

29. Mrs. W., 22 years old, a VII-gravida, at term, had suffered from edema for two months. In the last two weeks specks before the eyes, partial blindness, headache, nausea, and vomiting. Convulsion occurred twenty hours before admittance. Urine showed heavy trace of albumin, and many granular casts. Cervix admitted one finger. In ten hours cervix was dilated to four fingers by bags. Patient was having severe pains, when suddenly she became wildly delirious, and went into collapse, pulse almost imperceptible. No fetal heart sounds. Cervix dilated with hand, old scar tissue tearing, child extracted by version. Patient found to have a ruptured uterus, the tear extending transversely across the lower part of the uterus. Fetus dead. Uterus packed, but patient died in about half an hour, apparently from shock, as there was very little hemorrhage. (This case illustrates the danger of rapid delivery, especially in a multipara with old scar tissue. It is perfectly possible that the uterus may have ruptured spontaneously when the patient first went into collapse.)

30. Bella B., a negress, I-gravida, 30 years old, nearly at term, had suffered from edema for one month. For this was advised to come into hospital. Urine showed heavy trace of albumin and granular casts. Put on treatment, but did not improve. Became blind suddenly and had a slight convulsion. Cervix admitted two fingers and was soft. Accouchement forcé. Child living, but died at the end of hour from asphyxia, due to delivery. Mother's recovery rapid and uneventful. No more convulsions. (A mild type, with rapid recovery after delivery.)

31. Phyllis B., a negress, aged 26, III-gravida, at term, had noticed no symptoms of toxemia during pregnancy, other than edema of legs for last month. Entered hospital in first stage of labor, urine showing 40 per cent. albumin and casts. Labor normal, child healthy. Five hours after labor had a convulsion, and a

second one three hours later. No further convulsions, and recovery after this uneventful. Discharged twentieth day, urine normal. Baby did not thrive. Convulsive twitchings. Given nitroglycerin gr. 1-300 q. 4 h., and colon irrigations, and made a good recovery. Baby apparently affected in the same way as the mother was, and responded to the same kind of treatment.

32. Ida J., a negress, aged 25, II-gravida, at term. Her previous pregnancy, three years ago, was normal. During this pregnancy only slight headache and vomiting. Admitted in first stage of labor, with no albumin or casts, no edema. Labor normal. Child weighed nine pounds. Five hours after delivery, convulsion lasting two minutes occurred. No further convulsions. Recovery uneventful. Child seemed well in every way till thirty-six hours old, when he was found dead in his crib. Autopsy showed hemorrhage into abdominal cavity and under capsule of liver, with parenchymatous degeneration of liver and kidney.

33. Mrs. B., 35 years old, a VII-gravida, eight months pregnant, seemed well during pregnancy except for edema and slight headache. During the hot months of June and July there had been no cases of eclampsia at Sloane. On July 27, during a cold rainy spell, patient was seized with a convulsion after exposure; had three more in rapid succession, and one on the way to the hospital. Patient in deep stupor, pulse rapid and tense, urine 60 per cent. of albumin and full of casts, cervix admitted two fingers. Delivered at once by Braxton Hicks version and slow extraction. Living child. There was one slight convulsion during labor, and the seventh occurred as patient was being taken to the ward. Condition grew rapidly worse, deep cyanosis, edema of lungs, bloody fluid in stomach and running from mouth and nose. Temperature rose steadily to 106° and patient died eighteen hours after delivery. No autopsy. Baby lived and thrived. (This shows severe hemorrhagic type with rapid onset and fatal termination.)

34. Jennie R., a IV-gravida, 30 years old, a negress and at term. During pregnancy, so far as known, showed no symptoms. Other pregnancies normal. Urine before delivery not examined, but directly after delivery showed trace of albumin, but no casts. Patient entered hospital in first stage of labor, and had a normal labor and puerperium for eleven days, except for slight headache at times. Sudden convulsion on eleventh day lasting five minutes, a second four hours later, lasting a few seconds, and a third one hour later, lasting one minute. Urine now showed trace of

albumin and a few granular casts. Deep coma after each convulsion. Recovery was rapid and uneventful. Baby did well. (Peculiar case, showing no premonitory symptoms, late appearance of convulsions, with rapid recovery.)

35. Mrs. M., 35 years old, a III-gravida, at term, thirteen years ago had twins and marked toxic symptoms. One year ago a miscarriage with toxic symptoms again. During this pregnancy for two months has had edema; headache and eye symptoms for six weeks; all growing worse. Urine scant. A large woman with general edema and albumin 50 per cent. Cervix soft, three fingers dilated, two heads palpated. On delivery profuse bleeding from a lateral placenta prævia. Twins, extracted by accouchement forcé, both living and thriving. Three and a half hours after delivery a convulsion lasting two minutes. No further convulsions, and recovery rapid and uneventful. (A moderately severe case of post-partum eclampsia, complicated by twins, and placenta previa.)

36. Mrs. C., aged 20, I-gravida, eight and one-half months pregnant, had suffered from edema for one week; five and one-half hours before admittance had a convulsion. On admittance there was marked general edema, albumin 50 per cent., cervix admitting tip of finger only. After eight hours of bags, cervix was softened and accouchement forcé was performed. Child living. During labor there were six more convulsions, and two after labor. Recovery was slow, and marked by vomiting of blood and profuse hemorrhage from the bowel, so that patient became exsanguinated and pulseless. Starch enemata with opium given. Patient discharged twenty-fifth day, anemic, but otherwise in good condition. (This shows rapid onset, severe hemorrhagic type, not fatal.)

37. Mrs. G., a III-gravida, 32 years old, seven months pregnant, had been treated for albuminuria two weeks before, symptoms disappearing. On day before admittance a splitting headache, dim vision, and vomiting developed. Three hours before admittance a convulsion occurred. On admittance face and legs were edematous, urine boiled solid, and cervix was long and not dilated. In twelve hours, after bags, an accouchement forcé was done. A small child weighing $3\frac{1}{4}$ pounds was born alive, and lived. Recovery rapid and uneventful. (A moderately severe case, with rapid recovery after delivery.)

Of these thirty-seven cases, thirteen died, or 35 per cent., a high mortality. I am convinced, however, that eclampsia, like

many other diseases, varies greatly during different periods. Some cases are very severe, and under any plan of treatment patients will die. Others, with very little treatment, after emptying the uterus, get well rapidly. Of this series, the first two died. There were then twelve recoveries in succession. These were apparently not mild cases entirely, many were among the most severe of the series, but *all recovered* during this period, in the early fall. Of the next fifteen, occurring in the winter months eight died, five dying in succession. The method of treatment in these cases was practically the same as previously, but treatment seemed to be of no use. Of the next eight cases, in the late spring and summer, only one died. The cases, then, seemed to run in periods, doing well at one time, doing badly at others, with, of course, a few individual variations.

The period of pregnancy seemed to affect the mortality. Twenty-five (25) of the series were over seven months pregnant, and twelve seven months or under. Of the former, six died, a mortality of 24 per cent. Of the latter, twelve died, a mortality of fifty-eight per cent. In other words, the mortality when the disease occurred on or before the seventh month, was more than twice as high as when it occurred after the seventh month. The mortality among primiparæ and multiparæ was nearly even. Of twenty-one primiparæ, eight died, 38 per cent.; and of sixteen multiparæ, five died, 31 per cent. Age seemed to affect the mortality very little. Of nineteen who were twenty-five years old or less, six died, 31 per cent. Of ten over twenty-five, seven died, 38 per cent. The mortality was less in the colored than in the white woman. Of the former there were 9.2 dying, 22 per cent. Of the latter 28, 11 dying, 39 per cent.

In all of these cases except three, after delivery urine was voided in large amounts, with a normal amount of urea. In these three cases the urine was very scant and low in urea. In one of these cases the urine and urea were passed in sufficient amounts for two days, when there was a sudden suppression of urine. All of these three cases died.

The severest and most fatal type of the disease was the hemorrhagic, with vomiting of blood, blood in the stools, or petechiæ over the body. In the thirty-seven cases there were eleven of this type, and of these nine died, 82 per cent. mortality. Moreover, of the entire thirteen deaths of this series, nine, or 69 per cent. were of the hemorrhagic type. When these signs of hem-

orrhage, in the vomitus, stools, or skin are seen, the prognosis is always bad.

On the other hand, cases of post-partum eclampsia were nearly all of mild type. There were seven of these, the first convulsion occurring from within a few minutes to several days after delivery. One case occurred as late as the eleventh day. But all of these cases, except one, recovered, a mortality of 14 per cent.

Of the thirty cases of ante- or intrapartum eclampsia, twelve, or 40 per cent. were fatal. Post-partum, 7 cases, 1 death, 14.2-7 per cent.; intra-partum, 6 cases, 2 deaths, 33.3-3 per cent.; ante-partum, 24 cases, 10 deaths, 41.6-3 per cent.

After delivery many of these cases showed marked and immediate improvement. A few seemed to grow worse. And the rest were apparently not immediately affected. Eleven, or 37 per cent., showed immediate improvement; four, or 13 per cent., seemed to grow worse; and the rest, 50 per cent., were not immediately affected. Over one-third then showed immediate improvement, after emptying the uterus, and only one-eighth seemed worse.

If we consider the time elapsing from the first convulsion to the delivery of the patient, we find that in ten the interval was twelve hours or over, and of these, six died, a mortality of 60 per cent. In twenty the interval was less than twelve hours and of these, six died, 30 per cent. mortality. Or the fatality was about twice as high, where the delay in delivery was over twelve hours.

The delay before delivery, in many cases, was due to lack of medical attention, the patient being admitted to the hospital late. In other cases it was due to rigid undilated cervixes. In nineteen the cervix was dilated less than two fingers, when first seen. In eleven, two or more fingers. Of the former, nine died, a mortality of 47 per cent. Of the latter, three died, 27 per cent. mortality. Where the cervix, then, was rigid and dilated less than two fingers, when first seen, the mortality was nearly twice as high as when dilated two or more.

In method of delivery (nearly all of the cases were dilated first with bags) there were four so-called vaginal Cesarean sections, of which three died, 75 per cent. mortality. Accouchement forcé eighteen, seven dying, a mortality of 39 per cent. Forceps operations five, one dying, a mortality of 20 per cent., and normal deliveries ten (including the post-partum eclampsias), two dying.

20 per cent. mortality. This would seem to show that the more severe the operative procedure, the higher was the mortality. Vaginal Cesarean section 75 per cent., accouchement forcé 39 per cent., forceps and normal deliveries 20 per cent. each.

Premonitory symptoms, giving ample warning of approaching danger, were present in twenty-nine out of the thirty-seven cases. Of the eight without premonitory symptoms, five were not under observation, and it is not possible to say that there were absolutely no warnings. But the remaining three were under close observation. Two were in the hospital, one for six weeks, the urine being examined weekly and never showing albumin or casts, and the woman never showing any toxic symptoms. The other showed a trace of albumin, but no other symptoms clinically. The third case, a private patient, had been watched throughout her whole pregnancy by a very good physician, and only once showed a trace of albumin, but no casts, and presented no toxic symptoms till she had been in labor about six hours. In nearly all of these cases then (75 per cent.) warning was given, had there been anyone to heed it. But in at least three of the series there was no warning, the convulsion coming like a flash of lightning from a clear sky.

Of the infants, 50 per cent. were saved (one set of twins made the total number of infants thirty-eight). Of the nineteen that were lost twelve were still-born, and seven died, many showing the typical lesions found in the adult cases of eclampsia.

The high maternal mortality during these thirteen months was undoubtedly due to the large number of cases of the hemorrhagic type occurring. Nine out of the total thirteen deaths, we have seen, being due to this type.

The methods of treatment, as I have said, I do not intend to discuss. In a disease the etiology and pathology of which are not known, treatment must be theoretical, empirical, or symptomatic. In general, however, the treatment follows five plain indications.

1. The prophylactic. As nearly all the cases give premonitory symptoms long in advance, this treatment is very satisfactory, as a rule. Few doctors have many cases of eclampsia in their private practices, for by care they prevent their patients from getting the disease, either by curing the toxemia, or by terminating pregnancy. This is the most encouraging thing concerning eclampsia; it can usually be prevented. When it once occurs, no plan of treatment seems to be entirely successful.

The curative treatment presents four main indications:

1. To control the convulsions.
2. To empty the uterus.
3. To stimulate the excretions.
4. To treat the patient.

For the control of the convulsions, chloral, chloroform, and morphine were used. Chloral, in repeated doses by rectum; chloroform simply to abort convulsions and during operative procedures; and morphine to keep the patient quiet and prevent further convulsions. Nitroglycerin was used in all cases to soften the arteries. Veratrum veride, when the pulse is tense and rapid, seems to have a quieting effect, slows and softens the pulse, and is said to prevent the recurrence of convulsions. This was generally used in preference to venesection.

2. To empty the uterus, the quickest way consistent with safety was best. We have seen that the rapid emptying of the uterus gave much better results than long delay. A delay of twelve hours or over showed a mortality of 60 per cent.; of less than twelve hours only 30 per cent., while more than one-third of the cases showed immediate improvement after emptying the uterus, and only about one-eighth seemed to be worse. On the other hand, severe operative procedures seemed to result in higher mortality. Vaginal section, 75 per cent.; accouchement forcé, 39 per cent. and forceps and normal deliveries, 20 per cent.

3. For stimulating the excretions, cathartics, calomel, and salts; colon irrigations, four gallons of hot salt solution every eight hours, acting on the kidneys, skin, and bowels at the same time; and hot packs in certain cases were used. Venesection was resorted to in four cases and intravenous infusions of saline eleven times. Fluids in large amounts always.

4. Patients needing stimulation were given caffeine and sodium salicylate generally. Strychnine was also frequently used and symptomatic treatment as required.

Results taken from different methods of treatment are practically worthless, in most cases, as the treatment must vary so with the indications, but the following results of treatment may be interesting.

Venesection was resorted to in four cases, all of which died, 100 per cent. mortality.

Intravenous infusions of normal salt solution were given in eleven cases (three of these as a last resort); eight of which died.

72 per cent. mortality. As only the severer cases were infused, this observation is of little value.

Hot packs were given to eleven patients, four of which died, 36 per cent. mortality; not given in twenty-six cases, nine dying, 34 per cent. mortality. This is again misleading, as the milder cases did not need hot packs.

Morphine was used in addition to the chloral and chloroform in eighteen cases, with five deaths, 27 per cent. mortality. In nineteen cases it was not given, entire reliance being placed on the chloral and chloroform, with eight deaths, 42 per cent. mortality.

Veratrum veride was used in thirteen cases, and of these three died, 23 per cent. mortality. It was not used in twenty-four cases, of which ten died, 41 per cent. This was only given when the pulse was rapid and tense.

Oxygen was given in five cases as a last resort, four dying.

I have tried to give you this evening a series of clinical pictures of this puzzling disease, so mysterious in its origin, so sudden in its onset, so fatal in its results.

The pictures show a disease giving premonitory symptoms in over 75 per cent. of the cases, varying greatly in severity at different periods, most fatal in the cold months; equally fatal in primiparæ and multiparæ, and in the young and old; more than twice as fatal when occurring in women before the seventh month of pregnancy, or when the cervix is rigid and not dilated, than when occurring later in pregnancy, or with a dilated cervix; extremely fatal in the hemorrhagic type, very much less so in the post-partum type; showing a rapid improvement after emptying the uterus in more than a third of the cases; and showing a much higher mortality where there is delay in emptying it, twice as high where the delay is twelve hours or more; but showing itself, however, more fatal when severe operative procedures are resorted to; a disease giving an infant mortality of 50 per cent.; a disease responding well to treatment at times, at others apparently not affected by any treatment instituted. We hope that the future will bring us more information as to the nature of this disease, and surer methods in its treatment.

SLOANE MATERNITY HOSPITAL.

LEUCOCYTE COUNTS IN GYNECOLOGY.*

BY

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THE changes that take place in the white blood cells, in the total and the differential counts, in different normal and abnormal conditions, is a subject of considerable recent investigation and one of undoubted value to the physician and surgeon. Our present ideas are crude and indefinite and will probably have to be changed more or less, and new interpretations of known facts will take the place of some of the old ones, before the true value of a leucocyte count as a factor in the prognosis and diagnosis of a case is definitely settled. It is my desire in the present paper to record only my own experience with the subject. This experience has been entirely clinical. On the gynecological division of the Roosevelt Hospital, it is the custom to have a complete leucocyte count made at the time of admission of all cases that have any abdominal symptoms. The only exception to this rule is with cases of uncomplicated displacement of the uterus; the count is omitted with these cases if the service is active, and the time of the members of the house staff is otherwise occupied. The counts are made between 9 o'clock and 12 o'clock, unless the urgency of the case demands a count at other hours, by members of the hospital house staff. These men during their service have a wide experience in making blood counts and are able to make them accurately and quickly. If an emergency case is admitted to the hospital, usually the blood count is ready by the time the case is examined by an attending. The blood count is looked for with the same regularity that the temperature and pulse are.

It is not possible to give the exact number of leucocytes normally present in the blood, as the number varies under different normal conditions, also the numbers given by different investigators are not the same. It may be considered practically that any count under 10,000 has no clinical significance.

* Read before the New York Obstetrical Society, February, 1906.

There are a number of different classifications of leucocytes. The one that we use, with the approximately normal percentage of the different cells, is as follows:

- (a) Polynuclear leucocytes, 70 per cent.
- (b) Lymphocytes, 28 per cent.
- (c) Eosinophile cells, 2 per cent.
- (d) Mast cells, .5 per cent.

In some classifications the lymphocytes are further divided, and in some transitional cells are included. The classification given above is the one used at the Roosevelt Hospital, and is the one followed in the accompanying tables.

All cases in the tables were operated on by the writer, and none was included in a previous publication, and the diagnosis given is the one made at the operation.

Ovarian cysts if uncomplicated do not cause any leucocytosis, as is shown by the eight cases in Table No. 1. The highest nuclear count in these cases was 67.5 per cent. Three cases had total counts of 10,500, 12,100, and 13,400; all the other cases had 7,000 or less. Not included in the table, I have had two cases of malignant papilloma of the ovary that showed no leucocytosis. Also one case of small simple ovarian cyst that had ruptured but caused no leucocytosis. I think the rupture of a large cyst or the rupture of any cyst, the contents of which were irritating to the peritoneum would undoubtedly cause a leucocytosis, though I have not had an opportunity to observe such a case nor have I seen any record of such a case in the literature. There are, however, three other conditions under which an ovarian cyst may cause a leucocytosis: (1) if the pedicle becomes twisted, (2) if the cyst becomes infected, and (3) if from any cause the peritoneum becomes irritated by the cyst. I have had one case of ovarian cyst with a twisted pedicle, with a leucocytosis of 18,800. I have also had five cases of suppurating ovarian cyst with total counts of 9,000, 10,000, 17,000, and 26,000. We would naturally expect a high leucocyte count in the early stage of the infection and to have it decrease as the acute symptoms subside. In the early stage of the infection, there is more or less exudate about the cyst, and with it a corresponding leucocytosis. After the exudate has been absorbed, there is remaining a collection of pus from which there is little absorption, and the leucocytosis decreases. Of my cases, the one with 26,000 leucocytes was an acute case, recently infected; in the others the exudate had been

largely absorbed. I have had no case, in which a blood count has been made, in which the peritoneum had been specially irritated, excepting by a twist in the pedicle. It is not uncommon for a patient with an ovarian cyst to have attacks of the so-called aseptic peritonitis, accompanied by pain, tenderness, and a slight rise of temperature. Such a case would undoubtedly have a leucocytosis. Dützmänn, somewhat indefinitely, speaks of such a case with a total count of 26,000, though this may have been a case of twisted pedicle.

OVARIAN CYSTS. TABLE NO. I.

Case No.	Date.	Temp.	Pulse.	Leuco-cytes.	Poly-nuclear.	Lym-phocytes.	Eosino-phil.	Mast Cells.	Diagnosis and Operation.
1	Jan. 4	98.4	78	13,400	63.	30.	5.	2.	L. Ovarian Cyst,
	Jan. 6	.....	.....	.....	.....	.....	.....	.....	Ex. L. Appendage.
2	Aug. 7	99.	100	12,100	67.5	30.	1.5	.0	L. Ovarian Cyst,
	Aug. 7	.....	.....	.....	.....	.....	.....	.....	Ex. L. Appendage.
3	July 18	99.	96	10,500	63.	35.5	1.	.5	L. Ovarian Cyst,
	July 21	.....	.....	.....	.....	.....	.....	.....	Ex. L. Appendage.
4	July 13	99.	80	7,000	52.5	44.5	2.5	.5	L. Ovarian Cyst,
	July 14	.....	.....	.....	.....	.....	.....	.....	Ex. L. Ovary.
5	Apr. 8	98.8	70	7,000	.....	.....	.....	.....	R. Ovarian Cyst,
	Apr. 15	.....	.....	.....	.....	.....	.....	.....	Ex. R. Appendage.
6	Apr. 22	98.8	88	6,500	.....	.....	.....	.....	L. Ovarian Cyst,
	Apr. 22	.....	.....	.....	.....	.....	.....	.....	Ex. L. Appendage.
7	Mar. 29	98.8	96	4,500	.....	.....	.....	.....	L. Ovarian Cyst,
	Apr. 1	.....	.....	.....	.....	.....	.....	.....	Supravag. Hysterect'y
8	June 24	98.8	88	4,000	53.	46.	.....	.....	R. Ovarian Cyst,
	June 24	.....	.....	.....	.....	.....	.....	.....	Ex. R. Appendage.

Fibroid tumors of the uterus, if uncomplicated, do not cause any leucocytosis. This is illustrated by cases No. 1 to 8 in Table No. II. In none of these cases is either the total or the differential leucocyte count beyond the normal limits. If there is a leucocytosis in a case of fibroma, and there is no cause for it elsewhere, it is indicative of one of three things; that there has been a recent severe hemorrhage, that there is some outside complication such as a pyosalpinx, or that the tumor itself is undergoing some degenerative process. I have myself had no opportunity to observe a case of leucocytosis due to a severe hemorrhage in a case of fibroid tumor of the uterus nor have I found such a case recorded in the literature. That it may occur is theoretically beyond doubt. A slow, continuous bleeding, even if of a duration

and amount to reduce the patient to a condition of extreme anemia, does not in my experience produce a leucocytosis. One case previously recorded, with the hemoglobin reduced to 15 per cent. and the red blood cells to 1,400,000, had only 7,000 leucocytes. Another case with 25 per cent. hemoglobin and 1,584,000 red blood cells, had 12,700 leucocytes. Birnbaum states that he has seen no case of leucocytosis due to the slow continuous bleeding of fibroids, ectopic pregnancy, etc., even if of considerable duration. Cases No. 10 to 13 each have the outside complication of a single or double pyosalpinx and the high polynuclear percentage is due to the complication and not to the tumor. Dützmänn reported four similar cases. Case No. 9 in the table with a total count of 28,900 and 85 per cent. of polynuclear cells came to the hospital with a fibroid reaching to the umbilicus, having had a fall four hours before admission. The injury was probably the cause of the leucocytosis though at the operation no complication was found. In no case of this series were there any degenerative changes in the tumor itself. I have seen one case of a small gangrenous fibroid with a leucocytosis of 15,000 and I would expect to find a leucocytosis in every case of gangrenous or broken down fibroid if this degenerative change is of recent origin.

The leucocyte count in cases of ectopic pregnancy is particularly interesting. These cases may conveniently be divided for consideration here into four classes.

- (a) Unruptured.
- (b) Ruptured and still bleeding.
- (c) Ruptured but no bleeding for some hours.
- (d) Pelvic hematocele.

(a) In the present table there are no cases recorded which were unruptured at the time of operation; but in a previous publication, I have recorded three such cases with total leucocyte counts of 7,000 10,400 and 11,000, that is, counts that are practically normal. There is here no chemotactic influence at work, neither do the conditions obtain that are present with an active hemorrhage and the blood count is the one that we would naturally expect.

FIBROMYOMA UTERI. TABLE NO. II.

Case No.	Date.	Temp.	Pulse.	Leuco-cytes.	Poly-nuclear.	Lympho-cytes.	Eosino-phil.	Mast Cells.	Diagnosis and Operation.
1	May 15	98.8	84	4,000	....	....	....	....	Fibromyoma Uteri,
	May 20	....	....	....	....	....	....	....	Supravag. Hysterect'y.
	May 23	100.8	114	12,500	88.5	11.	.5	.0	
2	June 17	99.6	96	6,500	61.	37.	1.5	.5	Fibromyoma Uteri,
	June 17	....	....	....	....	....	....	....	Supravag. Hysterect'y.
3	Dec. 3	98.8	96	7,600	50.	49.	1.	.0	Fibromyoma Uteri,
	Dec. 4	....	....	....	....	....	....	....	Supravag. Hysterect'y.
	Dec. 5	100	104	8,800	78.	22.	.0	.0	
	Dec. 7	98.8	92.	10,500	77.5	22.	.5	.0	
	Dec. 9	99	80	5,400	68.	32.	.0	.0	
	Dec. 11	99	86	8,600	52.	47.	1.	.0	
	Mar. 29	98.8	80	9,000	....	....	....	....	Fibromyoma Uteri,
4	Apr. 8	....	....	....	....	....	....	....	Supravag. Hysterect'y.
	Oct. 7	100	104	9,200	70.	24.	6.	.0	Fibromyoma Uteri,
5	Oct. 7	....	....	....	....	....	....	....	Complete Abd. Hys- terectomy.
	Oct. 10	100	126	15,700	79.5	19.	1.	.5	
6	July 7	99	88	9,600	59.4	39.3	1.3	.0	Fibromyoma Uteri,
	July 7	....	....	....	....	....	....	....	Supravag. Hysterect'y.
7	Jan. 4	102.8	100	11,500	70.	29.	1.	.0	Fibromyoma Uteri,
	Jan. 6	....	....	....	....	....	....	....	Supravag. Hysterect'y.
	Jan. 8	101.4	104	11,800	85.	13.5	.5	1.	
8	July 7	99	84	12,000	69.5	30.	.0	.5	Fibromyoma Uteri,
	July 7	....	....	....	....	....	....	....	Supravag. Hysterect'y.
9	Sep. 11	101	108	28,900	85.	14.5	.5	.0	Fibromyoma Uteri.
	Sep. 15	100.2	104	12,900	75.	24.5	.5	.0	
	Sep. 19	99	96	9,900	....	....	....	....
	Sep. 22	....	....	....	....	....	....	....	Supravag. Hysterect'y.
	Oct. 1	102.4	114	24,900	....	....	....	....	Pneumonia.
	Oct. 5	102.4	112	24,800	....	....	....	....
10	June 10	100	98	10,000	82.	18.	.0	.0	Fibrom. Uteri, Pyo- salpinx.
	June 10	....	....	....	....	....	....	....	Supravag. Hysterect'y.
11	May 11	101.6	102	14,000	80.5	19.5	.0	.0	Fibrom. Uteri, Pyo- salpinx.
	May 19	100.2	92	12,000	71.	28.5	.5	.0	
	May 20	....	....	....	....	....	....	....	Supravag. Hysterect'y.
12	Nov. 11	99	90	9,000	80.5	17.	1.	.5	Fibrom. Uteri, Pyo- salpinx.
	Nov. 18	....	....	....	....	....	....	....	Supravag. Hysterect'y.
13	Nov. 16	100	104	16,000	79.	20.5	.5	.0	Fibrom. Uteri, Pyo- salpinx.
	Nov. 16	....	....	....	....	....	....	....	Supravag. Hysterect'y.

(b) The leucocyte count of the class of cases that have recently ruptured and are still bleeding is well illustrated by case No. 1 in Table III. The total leucocyte count was 31,800 with 89.3 per cent. polynuclear cells. I have had one case not included in this table, in which the total count was 25,600. In a case recently

operated on at the Roosevelt Hospital by Dr. Brewer, the total count was 25,000 with 95 per cent. polynuclear cells. In each of these three cases, there was a rapid pulse, the patient was in a serious condition, and the abdomen was distended with recently accumulated blood. The condition that existed here was an acute hemorrhage of considerable magnitude, and the leucocyte count corresponds to the hemorrhagic leucocytosis described by various writers. This leucocytosis develops rapidly after a hemorrhage (Lyons reports over 41,000 after an hour), it is in proportion to the amount of blood lost, and to the rapidity with which it is lost, diminishes rapidly so that it is practically normal in from five to seven days. It is produced in part from the flow of lymph from the tissues into the vessels to make up the bulk lost, and doubtless in part from cells of the bone marrow, either cells already existing there or cells produced there by increased cellular activity, as shown by the large increase in the percentage of polynuclear cells that are found in post-hemorrhagic leucocytosis. That a high leucocytosis is always present after a severe hemorrhage is undoubtedly not true, as shown by one of the experiments of Rieder and as has been reported by Cabot, Stengel and others.

(c) In the cases that have ruptured but have not been bleeding for some hours, the amount of leucocytosis depends, as indicated above, on the amount and rapidity of the bleeding and the time that has elapsed since the bleeding ceased. This condition is illustrated by cases Nos. 2 to 6. The total leucocyte counts were 6,000, 7,000, 7,500, 11,000 and 13,000, the differential counts in three of these cases showed 74, 76 and 77 per cent. polynuclear cells. In these cases from five days to six weeks had elapsed since the first rupture and so far as could be determined by the history, in none of these cases had there been any bleeding in at least five days. The condition that existed in these cases was practically this—there had been a more or less extensive hemorrhage into the peritoneal cavity; this blood had been in part absorbed and in part shut in by adhesions and no longer caused any irritation to the organism. The condition corresponds closely to that existing after any hemorrhage, and both the total and differential leucocyte counts are the same as we would expect after any hemorrhage.

(c) Unless infected, cases of hematocele are practically the same as the last class of cases, and show the same leucocyte count. If they become infected, they are the same as a pelvic abscess,

and have a corresponding count. Cases Nos. 7 and 8 were cases of this type without infection and had total counts of 12,600 and 13,500: one of these had a differential count of only 62.5 per cent. polynuclear cells.

My observations in these cases of ectopic pregnancy agree with those of Birnbaum, Dützmann, Pankow and other writers.

ECTOPIC PREGNANCY. TABLE NO. III.

Case No.	Date.	Temp.	Pulse.	Leuco- cytes.	Pol- nuclear.	Lympho- cytes.	Eosino- philes.	Mast Cells.	Diagnosis and Operation.
1	Sept. 5	100.8	140	31,800	89.3	10.5	.2	.0	Rupture of Tube, Ex. R. Appendage.
2	Sept. 5 pr. 13	99.4	80	6,000	.....	.....	.....	.....	Rupture of L. Tube, Ex. L. Appendage.
3	Mar. 19	98.8	80	7,000	.....	.....	.....	.....	Rupture L. Tube, Ex. L. Appendage.
4	Jan. 20	100	116	7,500	76	23	.5	.5	Tubal Abortion, Ex. Tube.
5	July 3 July 11	99 101.6	96 112	11,600 21,200	74 74	23.5 25.5	2 .5	.5 .0	Tubal Abortion, Ex. L. Appendage.
6	May 28 June 3 June 5	..... ..... .....	..... ..... .....	13,000	77 86.5	22.5 12.5	.5 1	.0 .0	Tubal Abortion, Ex. R. Appendage.
7	Sept. 25 Sept. 25	98.8	104	12,600	62.5	33.5	4	.0	Pelvic Hematocele, Vaginal Incision.
8	Oct. 4 May 10 May 10	102.8 101.8	132 104	14,500 13,500	80	19.5..........	.5..........	.0	Pelvic Hematocele, Vaginal Incision.

It has not been the experience of the writer, that there is any total or differential leucocyte count that is positively diagnostic of a pyosalpinx. One case in the table had only 7,200 leucocytes and 61.5 per cent polynuclear cells, yet at the operation a double pyosalpinx was found. On the other hand, I have seen cases with over 90 per cent. polynuclear cells with no pus. I find, however, that the leucocyte count, especially the differential count, is of the greatest value to me in making the diagnosis and in consideration of the progress of these cases, as there is no doubt that a high polynuclear count is strongly indicative of pus. and that the increase or decrease of these cells is to me the best guide of the progress of the case. It is my experience that during the acute exacerbation of a pyosalpinx there is a high total leucocyte count and a high polynuclear percentage of the two, the total count diminishes more rapidly and approaches normal as the

Less than 70%	polynuclear	cells,	there	5	cases
71% to 75%	"	"	"	5	"
76% " 80%	"	"	"	7	"
81% " 85%	"	"	"	8	"
86% " 90%	"	"	"	7	"

INFLAMMATION OF APPENDAGES. TABLE NO. IV.

[illegible]

2	Nov. 11	104	116	24,000	87.5	12.5	.0	.0	Pelvic Abscess,
	Nov. 13	100	100	12,000	77.3	22.3	.3	.0	
	Nov. 17	.....	.....	.....	.....	.....	.....	.....	Vaginal Incision.
3	Oct. 12	101.4	100	17,000	79.	20.	1.	.0	L. Pyosalpinx, R. Tu-
	Oct. 13	102.8	116	19,800	81.	18.	1.	.0	bo-ovarian Abscess.
	Oct. 15	103	100	17,600	87.	12.5	.5	.0	
	Oct. 16	.....	.....	.....	.....	.....	.....	.....	Complete Abd. Hys-
4	Apr. 24	.....	.....	7,500	86.	14.	.0	.0	terectomy.
	Apr. 25	.....	.....	.....	.....	.....	.....	.....	R. and L. Tubo-ovar-
5	Apr. 25	.....	.....	.....	.....	.....	.....	.....	ian Abscess,
	Apr. 26	98.8	80.	.....	86.	14.	.0	.0	Complete Abd. Hys-
	Apr. 26	.....	.....	.....	.....	.....	.....	.....	terectomy.
6	Jan. 10	102.2	132	20,000	85.5	11.5	2.5	.5	Tubo-ovarian Abscess,
	Jan. 11	.....	.....	.....	.....	.....	.....	.....	Complete Abd. Hys-
	Jan. 12	99.2	124	17,800	84.	11.	3.	2.	terectomy.
7	Jan. 14	102.4	120	11,000	85.5	14.5	.0	.0	L. Tubo-ovarian Absc.
	Jan. 24	100.2	108	11,500	84.	14.5	1.	.3	
	Jan. 24	.....	.....	.....	.....	.....	.....	.....	Supravag. Hysterect'y.
	Jan. 29	99.2	112	11,000	81.	18.5	.5	.0	
8	May 13	102	120	19,500	85.	15.	.0	.0	R. and L. Pyosalpinx,
	May 13	.....	.....	.....	.....	.....	.....	.....	Complete Abd. Hyster-
9	July 29	104	112	11,800	84.5	15.	.5	.0	ectomy.
	Aug. 9	103	104	25,800	86.3	12.3	1.	.3	Pelvic Abscess.
	Aug. 10	.....	.....	.....	.....	.....	.....	.....	Vaginal Incision.
10	Nov. 20	103	112	15,200	83.5	12.5	3.5	.5	Pelvic Abscess,
	Nov. 23	102	108	9,800	80.3	18.6	1.7	.0	
	Nov. 23	.....	.....	.....	.....	.....	.....	.....	Vaginal Incision.
11	June 10	99.8	100.	20,000	83.5	16.	.5	.0	R. Tubo-ovarian Absc.
	June 10	.....	.....	.....	.....	.....	.....	.....	Abd. Ex. R. Appen-
	June 13	100.6	88	22,000	90.5	8.	.5	.0	dage.
12	May 12	102.8	100	16,000	79.	20.5	.5	.0	Pelvic Abscess,
	May 17	103.4	120	11,000	81.	18.5	.0	.5	
	May 23	101	104	16,500	.....	.....	.....	.....	Vaginal Incision.
	May 23	.....	.....	.....	.....	.....	.....	.....	R. and L. Pyosalpinx,
13	Nov. 11	99	90	9,000	80.5	17.	1.	.5	Supravag. Hysterect'y.
	Nov. 18	.....	.....	.....	.....	.....	.....	.....	R. and L. Pyosalpinx,
14	May 11	101.6	102	14,000	80.5	19.5	.0	.0	
	May 16	100.	98	6,500	.....	.....	.....	.....
	May 19	100.2	92	12,000	71.	28.5	.5	.0	Supravag. Hysterect'y.
	May 20	.....	.....	.....	.....	.....	.....	.....	Pelvic Abscess,
15	July 2	102.4	116	9,400	80.5	19.	.5	.0	Vaginal Incision.
	July 8	.....	.....	.....	.....	.....	.....	.....	R. and L. Pyosalpinx,
16	Apr. 24	102.4	102	13,000	78.	20.	2.	.0	
	May 5	102	108	19,000	80.	19.	1.	.0	Complete Abd. Hys-
	May 6	.....	.....	.....	.....	.....	.....	.....	terectomy.
	May 9	103	128	23,000	86.5	13.5	.0	.0	
	May 12	101	112	5,000	82.	17.5	.5	.0	
17	Oct. 23	99.6	112	13,200	79.5	20.5	.0	.0	L. Tubo-ovarian Absc.
	Oct. 23	.....	.....	.....	.....	.....	.....	.....	Abd. Ex. L. Appen-
	Oct. 23	.....	.....	.....	.....	.....	.....	.....	dage.
18	Nov. 16	100	104	16,000	79.	20.5	.5	.0	R. and L. Pyosalpinx,
	Nov. 16	.....	.....	.....	.....	.....	.....	.....	Supravag. Hysterect'y.
19	Dec. 14	100.2	108	14,100	78.	22.	.0	.0	R. Pyosalpinx,
	Dec. 27	99.	116	9,800	70.5	29.	.5	.0	
	Dec. 27	.....	.....	.....	.....	.....	.....	.....	Abd. Ex. R. Appen-
	Dec. 27	.....	.....	.....	.....	.....	.....	.....	dage.

20	Dec. 25	102	114	13,200	78.	22.	.0	.0	R. and L. Pyosalpinx,
	Dec. 30	100.4	120	10,800	70.5	28.5	1.	.0	Abd. Ex. R. Appen-
	Dec. 30								dage and L. Tube
21	Oct. 18	101	88	10,200	76.	20.5	3.	.0	R. and L. Pyosalpinx,
	Oct. 21								Abd. Ex. R. Appen-
									dage, Resection of L.
									Tube.
22	Oct. 12	100.8	90	19,500	75.	25.	.0	.0	R. and L. Pyosalpinx,
	Oct. 21								Abd. Ex. R. Appen-
									dage and L. Tube.
23	June 28	99.2	84	14,500	74.	25.5	.5	.0	R. Pyosalpinx,
	June 30								Complete Abd. Hys-
									terectomy.
24	Dec. 23	100.4	102	9,500	74.	26.	.0	.0	L. Pyosalpinx,
	Dec. 27	98.4	90	10,100	66.5	32.	1.	.5	
	Jan. 2	98	90	6,900	65.	26.	8.	1.	Abd. Ex. L. Appen-
	Jan. 8								dage.
25	Oct. 22	98.8	90	6,600	73.5	23.	3.5	.0	R. Ovarian Abscess,
	Oct. 28	98.8	100	9,900	76.	23.	.0	1.	Abd. Ex. R. Appen-
	Oct. 28								dage.
26	June 19	99	100	13,000	73.5	25.	1.5	.0	R. and L. Pyosalpinx,
	July 7	98.8	100	14,900	70.9	25.3	3.3	.0	Abd. Ex. R. Appen-
	July 7								dage, Resection L.
									Tube.
27	Oct. 24	99.4	96	9,200	73.	26.	1.	.0	L. Pyosalpinx,
	Oct. 24								Resection L. Appen-
									dage. (R. Appen-
									dage had been re-
									moved.)
28	July 17	98.8	104	9,700	72.	23.6	3.6	.8	L. Pyosalpinx,
	July 20								Abd. Ex. L. Appen-
									dage.
29	Sept. 21	99.4	84	10,600	63.	33.	3.	1.	R. and L. Pyosalpinx,
	Sept. 22								Supravag. Hysterect'y.
30	Oct. 14	98.8	112	7,200	61.5	33.	4.	1.5	R. and L. Pyosalpinx.
	Oct. 14								Complete Abd. Hys-
									terectomy.
31	July 18	100	88	10,000	58.	41.5	.0	.5	L. Pyosalpinx,
	July 21								Supravag. Hysterect'y.
32	Jan. 27	99	96	7,200	67.5	30.	2.	.5	R. and L. Tubercular
	Jan. 27								Pyosalpinx,
									Complete Abd. Hys-
									terectomy.

I have not had enough cases of malignant disease of the uterus during the past year to make a series of cases to illustrate the leucocyte counts in such cases. In the literature, it is usually reported that there is no leucocytosis associated with cases of carcinoma, even if the case is well advanced and the cachexia is pronounced, unless there is some local inflammation, necrosis or severe hemorrhage. In one case seen by me during the past year the total count was 7,200 and the polynuclear count 61.5 per cent. In another case, a patient of Dr. Tuttle, the total count was

6,500. The latter case was so far advanced that no operation other than a cauterization was possible. I have also seen a case of rapid recurrence of papilloma of the ovary that remained in the hospital until she died that had at no time a leucocytosis above 14,000.

It is not possible to arrange tables that will illustrate the value of a leucocyte count as a guide to the progress and outcome of a case, though possibly here is its greatest value. It should not, however, be taken by itself but in conjunction with the pulse, temperature and other symptoms. A low total count in a patient seriously ill is indicative of poor resistance of the organism and a bad prognosis. I have at present in the hospital a patient, who is septic following an abortion, with a total count of only 7,200 of which the polynuclear cells are 84 per cent. and the patient will probably die. A high total count is an indication of better resistance and also of the extent of the disease. A decreasing total count and a decreasing polynuclear percentage are both indicative of improvement. In that class of patients common in hospital work, in which a patient profoundly ill from sepsis following an abortion is admitted with a high pulse and temperature and a pelvic exudate so extensive that it is not possible to determine the extent of the lesion, to decide the question of operation and the time to operate is difficult, the change in the leucocyte count from day to day is of the greatest importance in making the correct decision.

Subsequent to operation there is a post-operative leucocytosis of several thousand above the total count previous to the operation, and a polynuclear increase often up to 90 per cent. even after small operations. This leucocytosis subsides usually in four to six days subsequent to the operation, and it is important that we do not confuse this post-operative leucocytosis with the leucocytosis that is caused by complications that may follow an operation: such complications may be wound infection, phlebitis, pneumonia, peritonitis, etc. The leucocytosis due to complications of an operation must of course be considered together with the other symptoms and not by itself.

MACROSCOPIC APPEARANCES OF THE OVARY WARRANTING ITS REMOVAL.*

BY

BACHE McE. EMMET, M.D.

It must be that some questions bearing upon this subject are still not well settled, else it were not possible for one author, within a few years, to state that, among 300 specimens of tubes and ovaries sent to him by five different operators for examination, no anatomical change whatever could be found in at least five per cent. of the number.

Certain types of ovary are not pathological notwithstanding their morbid appearance. Some ovaries are naturally exceedingly large and flabby. I have noticed such organs especially among the Polish and Russian women. When such specimens come to our notice on the operating table, we may deem them pathological either from their size or peculiar consistency. Generally, such is not the fact, however, and they may be passed over without surgical work, unless it be that, from their tendency to prolapse, they need to be suspended by attachment, either below the Fallopian tube or, should the part have sagged, by shortening of the infundibulo-pelvic ligament. Dr. Barrows recently published a series, I think, of twelve cases, in which he suspended prolapsed ovaries by passing them through a cut in the broad ligament and making them fast on its anterior face.

Extra large ovaries are seen also at times in children during life or on the post-mortem table. They have also been observed in the new-born. In such instances this condition has been looked upon as a proliferation of connective tissue, dependent upon a low grade of inflammation during fetal development.

In later life we see many which present a very considerable enlargement of this same character, in this case, owing either to repeated unphysiological hyperemia and the formation of new connective tissue alone, or with the addition of distended Graafian follicles. Yet, on the operating table we should hardly call them pathological to the extent of requiring surgical interference, unless the past history had very pointedly indicated them

* Read at a meeting of the Woman's Hospital Society, January 2, 1906.

as a source of suffering due to constant lighting up of an old inflammatory process in spite of treatment. This is a type of chronic oöphoritis.]

The same element, the connective tissue, may in time, and without known inflammatory action, ultimately lead to great diminution in volume of the ovary. This gives us the atrophic or cirrhotic ovary, shrunken, furrowed, shiny, with mother-of-pearl appearance, another type of chronic oöphoritis. This may well pass unnoticed or, frequently, such an organ is ablated as useless, in connection with a tube perhaps, in that the cortex has so changed in character that no more follicles can burst and yield their ova. Surely there are also naturally small ovaries, undeveloped, offering no special features to dwell upon, quite similar in appearance to the above; but, upon section, one will see no traces of corpora lutea. There is also the composite ovary, fissured, forming lobes, a mere curiosity; and, further, the supernumerary ovary, either single and approaching the normal in size, or more frequently represented by several small bodies, varying in size from that of a large pea to that of a marble, hanging from the proximal border of the normal ovary.

When viewing the pelvic contents just before, during or immediately after a menstrual flow (Mr. Tait used to advise operating immediately before or during menstruation, in order to avoid the extra loss of blood which, he felt, might be of great moment in an anemic patient), one sees one ovary or both, of a size quite beyond that of the intermenstrual time, turgid and bosselated and, to a beginner in abdominal surgery, the appearance may be the occasion of some surprise. It may be merely a condition of normal hyperemia such as is said to arise even with normal coitus; it may be that engendered by the approach of the monthly flow, or possibly, a follicle has already ruptured, forming a hemorrhagic cyst, large or small. A question might also arise, whether a new growth was developing or an inflammation of the ovary beginning. One should, of course, be influenced in interpreting the appearances by the time of the month and the history of the immediate past. Occasionally, one may have the advantage of having followed the case, and it may be possible to differentiate between those symptoms attributable to the conditions which offer us the opportunity of pelvic inspection from such as would belong more particularly to the ovarian lesion in question.

It is utterly perplexing to estimate the value of individual symptoms, and to allot one pain, or a portion of it, to a single organ, if two or more are at fault. So great is this difficulty that we often feel compelled to suspend judgment until the woman has had the benefit of treatment to simplify the question, or until the abdomen is opened for surgical work, permitting direct inspection of the various organs.

Should it seem imperative that the diagnosis be given at the moment, and should such a hyperemic ovary be at the same time the seat of enlarged follicles, no harm could be done by incising the substance of the ovary. I would indeed recommend doing this, making the cut the whole length of the convex border, laying the two halves open. We may then have a negative result, or other conditions which were not suspected may be revealed. The ovary may then receive its proper treatment and later be sutured together, or, if worse things have been found, ablation may be considered.

Russell and Schenck (AMERICAN JOURNAL OF OBSTETRICS, 1902) have reported a case of ovarian sarcoma developed from the theca externa of the Graafian follicle. I may mention also the possibility of the presence of tuberculosis of the ovary, or of a small dermoid, of an impregnated ovary, beginning gyroma or fibroma or endothelioma, or glandular cyst, benign or malignant, or papillary growth, or echinococcus.

It may, at some time, be our good fortune to see established in connection with every hospital, an expert pathologist, whose duty, upon request, it will be to give the operator the benefit of rapid diagnosis by the aid of the freezing microtome. To quote from "A Text Book of Diseases of Women," by Dr. Barton Cooke Hirst, 1905, in his description of the Jung-Hobel freezing microtome, ether spray. "Certain tissues freeze and cut much better than others. Pieces of cervix, uterus, solid growths, like carcinomata and sarcomata, as a rule cut well. On the other hand, it is difficult to get satisfactory frozen sections of endometrium, mucous polypi, or tissue containing a large amount of fat or blood. It is usually necessary to cut such sections thick." The sections, as they are cut, are placed in a 5 per cent. formaldehyde solution for three or four minutes; then are stained for one or two minutes in Delafield's hematoxylin, washed for one minute in water, and, if a hasty diagnosis be desired, are mounted in glycerin and examined. "If there

be no need of great hurry, three or four minutes extra can be allowed." "With a little practice, a diagnosis can usually be given in ten minutes from the time the tissue is removed from the patient, or often in an even shorter time."

Tuberculosis of the Ovary.—This occurs not infrequently, but much less often than in the tubes and the uterus. It is often found associated with the disease in other organs. Miliary tubercles may be found upon the surface of the ovary or in its depth, or they may have become caseous or broken down into abscesses. In cases of pulmonary tuberculosis or of tubercular peritonitis, we are quite justified in attributing a similar character to any enlargements or masses which we may find in the pelvis about the tubes and ovaries.

This appearance of miliary tubercles closely resembles what we sometimes meet with in very thick exudates which require some force to tear and dissect from about the tubes and ovaries. I have frequently seen numbers of small yellowish bodies strongly suggesting miliary tubercles, but I disregarded them as there were no other gross evidences of tuberculosis. A tuberculous ovary, even of miliary type, should always be removed; it may be that both will have to be taken out and, inasmuch as the infection has generally proceeded from a tube, the latter must, of course, be ablated also. If that means the two, the question of removing the uterus also then arises.

In the *British Gynecological Journal*, November, 1905, a case is reported of double tubal infection without any involvement of either ovary, according to the microscopic evidences, though one ovary was firmly embedded with its tube in firm exudate. The reporter, Dr. McNaughton Jones, mentioned two other cases of primary tuberculosis of the tubes, in each of which only one tube was affected. They were both perfectly healthy at the time when they were reported, and one had had four pregnancies since the adnexa were removed. Dr. Inglis Parsons, in discussion, asked whether all the lesions were miliary tubercles, or whether any of them were caseous. He quoted Behring as holding the view that the miliary tubercle was the expression of immunization, and stating that the serum which he proposed to use would produce ordinary miliary tuberculosis, non-caseating tubercle, and would act by immunizing the individual against the attack of the bacillus. So, possibly, we may look with less alarm upon the miliary tubercle, holding

that the patient is probably undergoing a natural process of immunization; but we should act quickly and thoroughly upon the finding of caseous and purulent foci.

Dermoid cyst of the ovary, or, as it has been proposed to call it, "embryoma," is the most common variety of ovarian tumor prior to puberty. It is usually of moderate size, seldom growing larger than a man's head; but it may be recognized, under the conditions we are now considering, when little more than minute. It is commonly single, but may be multiple and may be found in both ovaries. It is of a dirty white color, like dull mother-of-pearl, yet when growing large, it will show patches of color depending upon what contents lie near the surface. It is firm in most parts, though not solid, and is lacking altogether in the elasticity of a glandular cyst. It has a pedicle or involves the whole ovary. The thickened lining of such a cyst is covered with patches of hair and bits of sebaceous matter, with perhaps a bit of bone and some teeth implanted here and there.

Though the dermoids are usually classed among the benign tumors, there is a sufficient number of instances of their becoming malignant, to warrant us in always making a thorough ablation of the ovary which bears one. Ludwig (*Wiener klinische Wochenschrift*, 1905, No. 27) has collected eighteen cases of squamous epithelioma, one of adenomatous cancer, and two of sarcoma originating in ovarian dermoid cysts, and in *Virchow's Archiv* there is also mentioned one instance of cancerous degeneration of a dermoid of the mammary gland.

The teratoma is somewhat similar to the dermoid, but it is considerably more solid, is nodular and pedunculated; it is sometimes intraligamentary. There are only some fourteen cases on record. The outside is smooth, and the capsule has traces of ovarian structure. The interior is divided, by bands, into small spaces. These loculi are filled with brain-like substance which is young connective tissue and this, as well as the capsule, which is also composed of connective tissue, very readily undergoes sarcomatous change.

All of these possibilities being considered, I should advise that, upon thorough inspection of a suspected ovary, anything which does not at once proclaim itself innocent and harmless, be removed immediately, and that if a growth, however small, suggest active proliferation or malignancy, the ovary be taken away entire.

A general consideration of ovarian tumors, viewing them in their individual macroscopic characters, and from the standpoint of their effect upon the patient, rather than with any reference to minute pathology, serves best to furnish us a practical guide for action at the operating table. It is essential to associate the history of invasion and development of these growths with their condition when found. Knowing that some develop very slowly, others rapidly, in one case a delay in operating will do little or no harm; in another, it becomes a matter of very serious import. Some growths develop with suffering, others painlessly; some give one form to the abdomen, others present a different aspect; some produce a very slight morbid impression, others affect the system at large by causing general wasting through cyst formation, ascites, malignancy, hemorrhage, etc.; these drain the body of valuable material, the blood becomes impaired; or complications develop, heart and kidneys are implicated, adhesions to neighboring parts form, there are pressure upon vessels and nerves, torsion of pedicle, gangrene of the sac, etc. All of these points being considered, we may have a very fair impression of what we have to deal with before the abdomen is opened, so that if we keep in mind the various features of the simple cyst arising from the ovarian follicle, those of the cystadenoma, the carcinoma, then of the solid varieties, fibroma, myoma, sarcoma, etc., with the dermoids, we shall be thoroughly equipped.

In acute oöphoritis one ovary, or both, may reach an enormous size, from excessive hyperemia in the first stage, and congestion, possibly following hemorrhages into their tissue up to and including the time of pus formation, if this occur. Such an ovary presents a bosselated surface of dark color, especially if there has been extravasation; furthermore, the vessels upon the surface will be much congested, and there may be mottling patches of lymph. Should the active process of inflammation have ceased at this point, one part of the picture is complete. If pus formation be the further step, the surface of the ovary will show numerous yellow spots, and, later, the abscess proper develops by coalescence of the multiple foci into one cavity. Should resolution, on the contrary, take place, there will be evidence of diminished congestion, and some beginning of shriveling.

If the oöphoritis be of the type which neither resolves nor

yet develops to abscess formation, an exudate appears, and here and there the ovary seems about to attach itself to whatever part lies in close proximity. Such a process may, of course, be maintained for some time, but not usually unless the virulence is being constantly conveyed from the ovary to the tube. The ovary is, as a rule, comparatively slightly adherent if it has depended upon its own infection. Pus from a primary oöphoritis, or from a broken-down cyst of the ovary, infective or malignant, or from appendix infection, is frequently short-lived. That from bowel infection is more intense and lasting; puerperal infection ceases or kills early, but that from a gonorrheal tube plays the greatest havoc and seems to be the most enduring. In puerperal sepsis it is different; material is constantly carried by the veins and lymphatics to the substance of the ovary, and the development may be slow; but the worst kind of abscess usually forms rapidly. There need be no thought of removing an acutely inflamed ovary if it tends to undergo resolution, or if we feel certain that the source of the inflammation has abated or has been removed. If the inflammatory action has gone on to the production of pus, I know of no argument which will allow a man to refrain from ablation. The pus should surely be removed, and probably the entire organ. There are, however, cases of confined pus, which, when the plea is strong to save a portion of a sole remaining ovary, may be treated by thorough resection and proper cleansing of the cavity or surface, a piece of good working ovary being spared. Still, one must exhibit no false sentiment in the matter, and we should heed the essential precept to save life before indulging in what has been called "surgical amusement." Our purpose is to rid the woman first of all of her danger, secondly of her suffering, thirdly to restore her to usefulness. In such infectious cases as I have mentioned it becomes almost immediately a question of removal of ovaries, tubes and uterus.

I dwell upon chronic oöphoritis at some length, for it is my belief that in regard to this class of cases we find less unanimity of opinion among observers and operators than concerning all other conditions of the ovary. Possibly this is owing to considerable misunderstanding as to what constitutes a chronic oöphoritis; again, a general agreement being reached as to what constitutes such a condition, there seems to be much

diversity of opinion as to what shall be done with such ovaries.

Leaving out of consideration abscess of the ovary, which certainly stands for "chronic oöphoritis," in so far that the pus is a solution of the acute process, there are found exceedingly large ovaries which have maintained their size from the time when they were subject to hyperemia, and possibly, repeated attacks of acute inflammation, and which ache and throb at times, and present several pathological conditions, other than neuroses, such as disturbed menstruation and hemorrhages. Such ovaries are frequently seen free in the pelvis, though it may be they are prolapsed; at other times they are bound down by old adhesions, which hamper them in performing their function and compress them more and more as the old exudates become firm and organized. This complication leads, in time, to still another type. Such ovaries are small, of irregular shape and wizened. Many show retention cysts, and many an exaggerated supply of firm blood-vessels. These ovaries are classed clinically as chronically inflamed, though there is no inflammation in them. The longer such conditions present, the more does connective tissue gradually displace the normal tissue, and a point is reached where the follicular activity ceases and atrophy is complete.

Puerperal conditions and gonorrheal infection are responsible for the larger number of such ovaries; though several others play no small part, such as sexual excess, unsatisfied desire, prevention of conception, besides imprudence in chilling the body, arresting menstruation, etc. Whatever the cause, we have to deal usually with such ovaries when they have passed through the acute exacerbations to the chronic form. The late Mr. Tait says in his book: "In very many of the cases of which I now speak, no line can be drawn which will define where simple hyperemia ends and acute or chronic ovaritis begins;" and further: "This ovarian hyperemia, in fact, is only the mildest form of a serious disease which may end in total inflammatory disorganization of the ovaries of newly-married women;" and, "In prostitutes of a tender age this affection is of extreme frequency and often ends in the chronic ovaritis with adhesion of the Fallopian fimbriæ to the ovary, and the subsequent atrophy of all the sexual structures so often observed."

While we may be able, by various mild means, to relieve such

women, we must, in many such cases, have recourse to operation. What I wish to particularly urge upon all operators is to do more high-class conservative work upon the ovaries and tubes, and here I link these structures of necessity as they are so frequently bound together, in fact, and it is advisedly that I use the expression "high-class," because there is, oftentimes, too much attempted in the wrong direction and, at other times, an organ is sacrificed too readily.

There are circumstances which demand that, in operating, we should leave a portion of one ovary, even should both be invalidated, as by cystic disease. These conditions are represented by the age of the woman and her desire for a child. This precept, somewhat modified, has assuredly been urged upon operators from the earliest days of ovariectomy (by Sir Spencer Wells) and Martin and Schroeder have practised the principle faithfully for many years. Tuffier, Pozzi and Polk and our late associate, A. Palmer Dudley, have also been conscientious advocates of the same method and worked earnestly to establish rational conservatism. Notwithstanding such eminent men as I have named—and there are many others: Boldt, Coe, Hanks, Burrage, Isaac, Ill, McMonagle, Vineburg, Bovee, and still more—even though such men have shown the way, I fear that we do not all claim to be as earnest in our endeavor to practise proper conservative surgery as we should be.

Many surgeons have, within a few years, advocated the removal of an ovary and tube, even though they may only have been embedded in adhesions, and others, dreading that the healthy one might become diseased from the original cause, have not hesitated to advise the ablation of both. At this day, no one would countenance the removal of a sound adnexum under like conditions, merely for fear of the possibility of having to operate a second time, unless, indeed, the menopause were at hand (for the uterus can be thoroughly curetted and well drained). Even in an extreme case, if a bit of ovary is saved, an impaired tube, so long as it contains no free virulent pus, can be spared. The pus pocket can be cut out, in many instances, and a patent portion of tube may be found leading into the uterine cavity.

Should pus be *in* the ovary, I would naturally have my fears about seeking to save the organ, and would forego the attempt, unless it were the only ovary left and the woman capable

and desirous of bearing a child. Should such circumstances demand an extra effort, I would unhesitatingly turn out a purulent ovisac, using carbolic acid and peroxide of hydrogen; in short, destroy the pyogenic surface.

Under like conditions, that is, having only one ovary at an age when it is of vital importance to the woman, I question if I should not be bold enough to seek to save such an organ which has been soiled by pus from a suppurating tube, for instance. One frequently meets with such accidents when there is pus upon the peritoneum; either nature invariably proves wondrous kind, or such means as indicated above do avail to guard against peritoneal pelvic infection. I am thoroughly averse to doing an incomplete operation, but feel strongly that it is always our duty to give the patient the best chance.

I recognize, also, that there has been a mistaken notion of conservatism, and that much effort has been exerted in a wrong direction; that is, in trifling with diseased or degenerated tissue. One should never seek to preserve a truly diseased part, but only all that is good. In many ovaries which appear irretrievably diseased or destroyed, some appreciable particle may be found which is sound and serviceable. Such a remnant should be left *in situ*, or stitched to a portion of the broad ligament, or inserted partially within it. Aristol and Cargile membrane are useful adjuvants under such conditions.

In one of our last year's meetings I said, in replying to remarks on this subject, by the late Dr. Dudley, "I fully concur in the views expressed by Dr. Dudley to the effect that the term conservatism should not be limited to express the idea that one should constantly be striving to save a little tissue here and there without regard to the ultimate welfare of the patient." In other words, each surgeon should hold large views when dealing with pathological questions, and plan and execute his work with the purpose of not having to retrace his steps owing to the persistency of symptoms of the morbid condition for which the operation is performed, or the establishment of a new one in tissue under his consideration at the time. To wit: It frequently happens that one has to deal with an ovary quite studded with distended follicles. One may open up a number, cauterize the cavity and then stitch up the cortex, believing that good work has been done; when, as a result, one will shortly observe a marked enlargement of one or more

follicles, perhaps to the size of a walnut or of a pigeon's egg, producing intense pain and calling for a second operation. I remember well presenting such a specimen at one of our meetings, removed three weeks after the first operation, and I have met with a couple of other similar experiences. It is my practice, if a suspicion of a like condition comes to my mind, to remove the entire ovary or, if circumstances demand it, to leave the smallest possible fragment for continuance of its function. The same idea applies to treatment of the tube; take out not only all diseased tissue which one sets out to remove, but such other as from propinquity has been diseased, or may threaten to become so. In other words, do such surgery as shall best conserve the interest and the welfare of the woman.

An ovary embedded in adhesions may be freed and left, no matter how much injured, should it be the only one present and the age of the patient demand it, if the ovary or a fraction of it promises to be useful.

To illustrate, I quote these cases: that of McMonagle of San Francisco: Woman, 25 years, married three years, sterile; gradual dilatation of neck every second day for two weeks; six weeks in bed with excessive pain and fever; pelvic abscess discharged per rectum; operation. Many adhesions of intestines, ovary and Fallopian tube; the latter two structures, on right side, after being freed, were stitched to the broad ligament against the uterus. In separating the left ovary and tube he opened into a pus collection. This was followed by a troublesome hemorrhage. A portion of the tube was removed, the remainder being stitched to the broad ligament near the uterine horn; glass drain. She was pregnant two years later and was safely delivered.

The case of Dr. B. F. Baer (*Annals of Gynecology and Pediatrics*, January 1894) is also of interest: The womb and both appendages being firmly bound down by adhesions, he, by great effort, released the womb, tore the left ovary and tube piecemeal from their position and ligated their shreddy pedicle. The right appendages were found in an almost similarly diseased condition, and when they were dissected loose, they also were in shreds, the tube having been torn off about two inches from the uterus. Dr. Baer wished to remove them, but the patient's brother, a physician, who was present, did not

permit him to do so. Fifteen months later the woman gave birth to a child at full term.

Atlee reports two cases in which one ovary having been removed, the other became so cystic as to need repeated tapings; yet, each woman not only menstruated, but conceived and gave birth to a child. In one of these cases, a cyst of the sole ovary, the other having been removed many years previously, was tapped twice before conception, twice before delivery, seven times afterwards, and then was extirpated.

Robertson, in the *British Medical Journal*, mentions a remarkable case which occurred in his practice. He extirpated both the ovaries, which were diseased, yet the patient afterwards conceived and gave birth to a child. Of course, he had unwittingly left a scrap of healthy ovarian tissue, or else a supernumerary ovary was present.

THE TIME OF OVULATION.

BY

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A STUDY of the subject of impregnation demands a more or less cursory glance at several phenomena connected with it, together with the consideration of the generally accepted views of the nature and etiology of these phenomena.

Various German authorities, and notably Steinhaus of Leipsic, have called attention to what they chose to denominate the *Wellenbewegung des weiblichen Organismus*, i. e. the wave-like manner in which the manifestations of female physiology proceed. The pulse, temperature, blood pressure, muscular force, etc., of the female organism vary with the time of the menstrual cycle, all being more intensified just preceding the flow and most lax following it.

Menstruation is generally understood to imply a discharge of blood, mucus and desquamated epithelium from the body of the uterus, occurring normally every four weeks. The presence of epithelium has been questioned but it is considered by most investigators to be present in the discharge. Naturally the delicate cells soon disintegrate and could only with considerable difficulty

be recognized. Several years ago I had the opportunity of examining the uterus of a young woman who died during menstruation, and I found the epithelium shed over some areas and retained over others. Every precaution was used to avoid the misleading results of a faulty technique and the microscopical picture in this case corresponded exactly to the published drawings, representing the observations of others. It is certainly as well established as most physiological dicta that uterine epithelium is, to a greater or less extent, shed during the process of menstruation.

The menstrual cycle of twenty-eight days is divided, according to modern teaching, into four periods. In describing them it is most logical to begin at the end of menstruation proper. The first period is known, therefore, as the stage of repair, and occupies several days. During this time the small ruptured vessels close and the epithelium is regenerated. This is followed by a stage of quiescence lasting about two weeks, during which the uterine mucosa remains at a standstill so far as development is concerned. Then follows the constructive stage, lasting about a week. The mucous membrane now gradually hypertrophies until it reaches a thickness of five millimeters and is known as the decidua menstrualis. This is succeeded by the destructive stage or menstruation proper, lasting about four days, at the end of which time the mucosa has returned, by reason of loss of blood and cellular constituents, to its original thickness of one to two millimeters. With reference to the constructive stage I take occasion here to quote, not from some tentative journal article, but from a well established text-book in wide use in our schools, as follows: "The term constructive is applied to this series of changes for the reason that their apparent purpose is the preparation of the womb for the reception of the fertilized ovum." This, I believe, represents the proper conception of the conduct and significance of the uterine mucosa and of menstruation, *i.e.*, that the mucosa is prepared to receive the ovum and if the ovum does not come, in its disappointment, figuratively speaking, it commits suicide, to rise again from its ashes like the fabled phoenix. If the fertilized ovum does come, it not only remains contentedly in loco but continues its development.

The more difficult task now confronts us of considering the relationship existing between ovulation and menstruation. This question has been the subject of much study and much theorizing.

The menstrual history leads us to believe that an ovum ought to be expelled every twenty-eight days. Steinhaus had the opportunity of examining the genital apparatus of a young woman who died of phthisis after menstruating just six times. On her ovaries were found five plain scars and one doubtful one. There is reason to believe that the Graafian follicle which ought to burst at any given month does not always do so, but as a result of the premature loss of vitality in its particular ovum, the fluid of the follicle is absorbed and its cellular contents disintegrate. Such a retrograde process does not, as a rule, interfere with menstruation, which proceeds as a result of the established habit. If, however, an ideal and typical pair of ovaries exist, they will between them lose a perfect ovum every twenty-eight days. On this point most scientific men are agreed, and in the properly constituted female this is in all probability the sexual history. The unsolved problem and the problem whose solution is so necessary to the thorough understanding of embryology and pregnancy and the scientific calculation of the date of delivery is: At what time in the menstrual cycle is the ovum set free from the ovary?

It is very natural that one should more or less intuitively accept the belief that ovulation and menstruation are intimately connected and that the ovum is discharged monthly at or about the menstrual time. The hypothesis is certainly very plausible that the ovum is discharged during the early part of menstruation because the congestion of the parts favors the rupture of the follicle. The explanation appears logical enough. As a result of the congestion, which certainly exists, there is a transudation of serum or a hemorrhage from some tiny vessel into the follicle, which so increases the tenuity of its capsule that its continuity is no longer possible. After the acme of the period is passed there is no longer a strain upon the walls of any follicle which may be maturing, and it remains intact until the congestion of the next period induces its rupture. According to this hypothesis, then, the actual rupture of the follicle, *i.e.*, ovulation, depends upon menstruation. Seductive as the theory is, it does not stand close scrutiny, for can we believe that if congestion were so far advanced as to cause the rupture of the follicle, in case of fertilization of the ovum, it would suddenly subside and leave the uterine mucosa undamaged? Ovulation occurs independently of menstruation in young girls before the latter function is established and in women during lactation when it is temporarily

suppressed, for both these classes have become pregnant, which could not happen if they did not ovulate. Bitches examined five months after the removal of the uterus were found to have functioning ovaries. Werth (*Archiv. für G. & G.*, XII.) had the opportunity of examining a young woman, aged twenty-two, with congenital absence of the uterus, both of whose ovaries were lodged in hernias in the inguinal canals. They were observed to enlarge periodically. As they caused a great deal of suffering at these times they were removed, and upon examination showed all the evidences of functioning ovaries. Menstruation had, of course, never occurred. The hypothesis under consideration receives a crushing blow also from the fact that ovulation goes on in the lower vertebrates, which do not possess uteri, and therefore cannot menstruate.

Ovulation, then, occurs independently of menstruation, and if there is any interdependence between the two, menstruation must depend upon ovulation. The facts adduced to prove this hypothesis are most convincing. In spayed animals the rut does not again appear. In the vast majority of cases in which both functions are thoroughly established in the human female, if both ovaries are completely removed, menstruation ceases. In a series of one hundred ovariectomies reported by Wylie (*AMER. JOUR. OF OBSTET.*, XIX.) only one continued to menstruate. The exceptions to this rule are few and may be easily explained. In the first place, the ovariectomy may have been incomplete; some portion of one ovary may have been left behind. Secondly, for reasons of her own the patient may maliciously falsify. Thirdly, pathological conditions existing in the uterine mucosa may lead to hemorrhage, which is mistaken for menstrual flow. Fourthly, the force of habit may cause the few periods which occur after the removal of the ovaries.

If it is argued that menstruation does not follow ovulation in cases of chlorosis, or beginning tuberculosis, this is explained on the ground that nature conserves the strength of the system to combat the disease. In those cases in which women have become pregnant in the absence of menstruation during lactation, it is more than probable that the ovulation would have been followed in a few days by menstruation had not the fertilization of the ovum interrupted this event. The cases mentioned above, where young girls have conceived before menstruation was established, go to show that ovulation occurs just as cause precedes effect.

We can scarcely doubt that menstruation would sooner or later have occurred if the subject had not been impregnated.

Strassmann of Berlin (*Archiv. für G. and G.*, LII.) injected salt solution or blue gelatin into the ovaries of bitches and was invariably able by so doing to bring on the rut. His experiments were performed most carefully; various control experiments were used to make sure that the irritation of the ovary and not the disturbance of the operation was the real cause. In some cases one horn of the uterus was first excised and the ovary corresponding to the other was then stimulated. At the height of the rut so caused the animal was killed and the second tube removed. Both tubes were then examined microscopically and on comparing them the mucosa of the second was always found more hypertrophied and hyperemic than that of the first.

As a result of his experiments and after reviewing the arguments pro and con, Strassmann is most positive in his conclusion—"Das Eierstock funktioniert ohne uterus aber nicht der uterus ohne Eierstock"—the ovary functionates without the uterus, but the uterus does not functionate without the ovary.

Believing, then, that ovulation controls and causes menstruation—that menstruation is an evidence that the ovaries are functioning, we infer that, because menstruation occurs in the normal typical case every twenty-eight days, therefore ovulation occurs with the same regular periodicity. The exact time in the menstrual cycle at which the ovum is discharged has been the subject of much theorizing. The solution of this question is of importance. More accurate knowledge on this subject would afford the ability to give valuable advice to those desiring children and would furnish better data than we now possess for calculating the probable date of delivery. The question may be studied with greater exactness in the case of the fertilized ovum of pregnancy, and our conclusions in such a case may be with justice applied to the general course of ovulation.

To approach the subject analytically—the ovum in case of pregnancy must be discharged at the time of the last menstruation, at the time of the first missed menstruation, or in the intermenstrual period. In the first case, it is natural in connection with so important an event as the rupture of a Graafian follicle to look for some striking physiological phenomenon and the striking phenomenon in the sexual history of women is menstruation. That the profession in general believe that the ovum is dis-

charged at the menstrual period is evidenced by the fact that the date of delivery is calculated from the date of the last period—with most lamentable inaccuracy. This view probably gets its principal support from the observations of the sexual physiology of lower animals. Menstruation is considered the analogue of the rut, at which time animals become pregnant and therefore must ovulate. Any doubts of the analogy on the ground of discrepancy of periodicity are easily overruled. In animals the rut occurs at long intervals for the reason that the female almost always becomes pregnant at this time and the rut does not occur again until pregnancy is over and a considerable period of lactation has elapsed. If human physiology proceeded in the same manner a woman would menstruate once in about eighteen months. If, on the other hand, animals are prevented from intercourse the rut occurs at comparatively frequent intervals. Sutton found that monkeys menstruated every four weeks under such circumstances.

The menstrual discharge in animals differs from that in the human race in that it contains little or no blood. This difference can scarcely be considered, however, to invalidate the analogy as quantitative differences in the uterine mucosa would account for it. The remarkable difference lies in the fact that the time of the rut is the time when the female animal permits or even seeks intercourse, whereas in the human race intercourse does not, as a rule, occur during menstruation, and this is not the result solely of civilization, for in primitive races the menstruating woman is avoided.

The extrusion of the ovum is not known to occur exactly during the rut, the former precedes the latter somewhat. The male animal is attracted by the sight or odor of the discharge—dogs are said to scent it for miles—intercourse takes place, the spermatozoa ascend and exist in the upper end of the tube to fertilize the next ovum or ova discharged. This view is supported by what we know of the comparative vitality of ova and spermatozoa. The ovum, unless fertilized, is a short lived cell; the spermatozoa, on the contrary, are very tenacious of life.

Viewed from the standpoint of sexual desire, Bichoff and others suggest that the rut ought not to be held to correspond to menstruation, but rather to the ante-menstrual period.

Too much weight should not be attached to the analogy between the rut and menstruation as evidence of the time of human ovulation.

Against the theory that the ovum is expelled at the menstrual

time are arrayed the most incontrovertible arguments. If the ovum were discharged during or just before the last period why do we never have abortion between two periods? There would be time for a three weeks' abortion. Only one case, that of Merttens, has ever been reported, and one case is not enough to oppose universal experience. In the usual history of early abortion, this occurs a few days after the first missed period and the ova when discovered bespeak an existence of from ten days to two weeks. Peters reported a case in which the unfortunate woman committed suicide two days after the date for the beginning of the first missed menstruation. The ovum was discovered in the uterus postmortem, and was apparently one week old. As Ashfield says, every gynecologist composedly sounds a uterus if the last period has occurred in a normal manner.

Reichert argues against the fertilization of an ovum expelled at the last menstruation that the uterine mucosa would have to undergo two hypertrophies in one month, which is contrary to all that is known of the menstrual cycle.

A very strong argument against this theory is found in the tremendous clinical experiment imposed by the Mosaic ritual as set forth in Leviticus, xv. Intercourse was forbidden for seven clear days after the last day of the menstrual flow. Playfair, while considering the subject, wrote to one of his Jewish colleagues and learned from him that this rule was rigorously adhered to, especially on the continent of Europe. In this case, if the ovum were freed on the first day of menstruation and this function lasted its usual time, it would be eleven or twelve days before the ovum would even stand a chance of impregnation. Unfertilized human ova are not generally considered to retain their vitality so long, yet in spite of the restriction the Jewish race is as prolific as any other.

In this connection also Loewenhardt (*Arch. f. Gyn.*, iii.) collected 214 cases in which a single coitus occurred twelve days after menstruation. In sixty-five of these pregnancy resulted.

The idea that the ovum which was fertilized was expelled during the time of the first missed period easily comes to a *reductio ad absurdum*, for in that case what was there to have prevented menstruation from beginning as a result of its ordinary causes, whatever they may be? One fact is clear—that menstruation does not occur because pregnancy has occurred. The only possible explanation of the theory that the fertilized ovum is the ovum of

the first missed period, is that the ovum was expelled just as the period was about to commence, but was promptly fertilized by spermatozoa already in the outer end of the Fallopian tube or on the surface of the ovary, and the process of menstruation, although just ready to begin, was thus inhibited. This is too lightning-like. In the case of a young woman who died by accident two days before expected menstruation, Leopold found evidence of a recently ruptured follicle on one of the ovaries. Reichert and His think that the ovum is expelled two days before menstruation, yet in case of fertilization this is hardly time enough to account for the inhibition of menstruation, especially when we reflect that after the tremendous disturbance of labor, lactation is not established, as a rule, for over two days, and fertilization is a microscopic process occurring in a cell now wholly detached from the mother's body. Ample time must be allowed for the operation of such a cause. The fact is never to be lost sight of that it is not the extrusion of the ovum, but the fertilization of the ovum, which precedes the missing of the period, and fertilization may not occur immediately, but an appreciable time after the ovum is expelled.

In the light of the above arguments, it is scarcely possible to cling to the belief that ovulation and menstruation are contemporaneous and the same arguments militate further, although with somewhat abated force against the extrusion of the ovum during the few days immediately preceding or immediately following the period.

If now we abandon this idea and believe that ovulation takes place during the intermenstrual period, is it possible even approximately to locate the time of this phenomenon?

The three or four days following menstruation are days when the sexual apparatus is, so to speak, reduced to its lowest ebb, by reason of the local loss of blood. The uterine mucosa is repairing the damage to its epithelial lining. It is certainly not the time when we should rationally look for ovulation. It is true that many physicians are accustomed to advise those desiring impregnation to indulge in sexual intercourse during this time. If any success attends this plan it is probably due to the lack of obstruction to the ascent of the spermatozoa. The spermatoön ascends by reason of its own inherent motion. It is opposed, not aided, by the action of the cilia of the uterine epithelium. Just before menstruation the mucosa is swollen and the cavity almost closed.

Just after menstruation the mucosa is shrunken and the cavity ample, and, furthermore, the denudation of considerable areas removes the opposition which the cilia might offer. The spermatozoön, therefore, ascends to the tube with greater ease. We have seen that the vitality of the spermatozoön is such that it can exist in the fimbriated extremity for some time.

With reference to the last portion of the intermenstrual period, known as the stage of hypertrophy, it is generally conceded that the ovum is fertilized by the spermatozoön in the outer end of the Fallopian tube, therefore ovulation precedes fertilization. Now fertilization is the cause of the absence of the period following, and therefore precedes it. Ovulation precedes fertilization, and fertilization precedes the expected menstruation, therefore ovulation precedes the date of expected menstruation by a longer period of time than does fertilization. Ovulation may precede fertilization by an appreciable time, though it is not necessary for it to precede the latter by any considerable period, for living spermatozoa may be already in the fimbriated extremity of the Fallopian tube. The question is: How long must fertilization precede the expected menstruation in order to inhibit it? Certainly several days. Fertilization itself is so minute a process, occurring between cells totally separate from the mother's body, that we should scarcely expect any immediate effect on the maternal organism from it *per se*. It is the presence of the living, growing ovum in the tube which inhibits menstruation. It is not necessary for the ovum to be in the uterus in order that a decidua may be formed, for this occurs in cases of extrauterine pregnancy, where the ovum remains in the tube.

If we consider the nature of menstruation we cannot fail to observe that it is a retrograde process—a casting off of something which is useless. Ovulation would not directly cause such a process, for ovulation must be rationally regarded as a stimulus to new and extraordinary vitality. Ovulation would directly cause a building up and not a breaking down. And so, in conclusion, I advance the hypothesis that *ovulation occurs normally at the close of the period of quiescence, and initiates and, indeed, directly causes the period of hypertrophy*. Menstruation, on the contrary, is the result of the exhaustion and disappearance of the stimulus. If the ovum dies then all the preparations made for its reception are useless and must be disposed of. Menstruation, therefore, is an almost infallible proof that the last ovum dis-

charged from the ovary is dead. If, on the other hand, the ovum does not die, the stimulus begun with ovulation goes on, and the time for menstruation passes without that event. Leaving out of consideration those cases of missed menstruation, due to accidental or pathological causes, and considering only the typical, normal case, if the expected menstruation does not occur, then the ovum last expelled from the ovary is still alive. And, finally, if the last expelled ovum is alive at the time of the next expected but suppressed period, then that ovum is fertilized, for otherwise menstruation would have occurred.

20 WEST NINTH STREET.

HEMATOMETRA, CAUSED BY A MYOMA OF THE CERVIX.

BY

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(With one illustration.)

L. S., 27 years of age. Born in the United States. Family history negative. Is a cretin. Menstrual history indefinite. Applied for treatment on account of the rapid enlargement of her abdomen, which had been accompanied by an acute pain of such severity, that she had become invalided. She did not know when her abdomen began to enlarge. Examination revealed a pale woman, very fragile. Weight, 75 pounds. Height, 4 feet 6 inches. Was very poorly developed. There was a cloudiness of the left cornea. The vessels of the neck, especially the thyroid arteries, pulsated strongly. Both lobes of the thyroid glands were enlarged. Chest showed imperfect development. Lungs, normal. Heart was not enlarged. Over the aortic ostium, a loud blowing systolic murmur was heard, which was transmitted to the neck. The abdomen, which was globular in form, was enlarged symmetrically; this enlargement extended from the symphysis pubis to the xiphoid appendix, and laterally to the anterior axillary line on both sides. The configuration was that of a pregnant uterus. The tumor could be moved all over the abdomen without difficulty.

Fluctuation was marked. As the woman had a small, intact hymen no vaginal examination was made. Rectal examination revealed a mass, but nothing of diagnostic importance was elicited.

The fluctuation and mobility of the tumor suggested an ovarian cyst, had the middle of the mass not been confined to the median line—a point against this diagnosis. Cystic myoma could not be ruled out. The writer has never seen a hematometra of such magnitude, hence this diagnosis was not considered. and as the woman was a cretin, the amenorrhea was accounted for by the



1. Dilated cavity of uterus.
2. Myoma occupying position of cervix and causing its obliteration.

athyreoidismus. As the patient was an idiot she was unable to give a clear account of her amenorrhea, and it was only after the operation, when careful inquiry of her relatives was made, that the fact developed that she had never menstruated. As the tumor was very movable, the diagnosis of a cyst, either ovarian or dermoid was made. In view of the wretched condition of the patient, the abdomen was opened under infiltration anesthesia. This also interfered with a knowledge of the origin of the tumor. for under general narcosis the fact that it sprang from the uterus,

would probably have been elicited. The abdomen was opened without pain and the tumor delivered. It was then recognized that the mass was part of the uterus. If the patient had not been a virgin, pregnancy might have been suspected even after the abdomen had been opened. At the cervix a myoma was found the size of an infant's head. Supravaginal amputation was decided upon. A small quantity of ether was given and the operation quickly performed. The patient rallied without shock from the operation, and progressed normally for two days. She was seen by the writer sixty hours after the operation, and was found to have a normal pulse and temperature. Indeed, she was quite happy. Upon passing to the next bed in the ward, attention was again attracted to the patient; she was seen to be in a collapse from which she never recovered. She expired within fifteen minutes.

Autopsy revealed nothing that could account for the death of the patient. There was no sign of hemorrhage or evidence of infection. Examination of the tumor showed a large myoma of the cervix. No trace of the cervical canal could be demonstrated. The cavity which represented the dilated uterine cavity, contained about two liters of a greenish grumous fluid, of about the consistency of molasses and quite free from odor. This fluid, which contained no morphological elements, responded to the hemin test; so that this substance was probably degenerated blood. **Diagnosis:**—Hematometra due to myoma of the cervix uteri.

1316 VAN NESS AVENUE.

VENTROFIXATION FOLLOWED BY NORMAL DELIVERY.

BY

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AFTER having performed over six hundred operations of various kinds for displacements of the uterus, I see no reason to change the opinion I expressed in my first paper on this subject, published in this Journal ten years ago; namely, that when the uterus was normal in size and absolutely free from adhesions, and when there was no indication for opening the

abdomen, the Alexander operation for shortening the round ligaments was the ideal one. But when there were adhesions, or when the abdomen had to be opened for some other reason, the operation of ventrofixation gave the greatest satisfaction.

In that paper I thought that ventrofixation should be reserved for cases in which, there being adhesions, the ovaries and tubes were diseased, and should, therefore, be removed, in which case a future pregnancy would be impossible; while in all cases in which pregnancy was possible an Alexander should be done. But soon after that the tide of so-called conservatism flowed in and I began saving one ovary or a part of one, and then doing ventrofixation, with some anxiety on my part as to what would happen if pregnancy should occur.

Among the first few cases of pregnancy following the new operation of ventrofixation, there were some very disastrous labors reported by several leading operators; but on investigating these I found that the bad results were entirely due to faulty technique, all of the cases having been done in such a way as to sew the back instead of the front of the uterus to the abdominal wall, the uterus thus being placed upside down in the pelvis, with the os pointing towards the liver. When labor began the child's head presented upwards towards the diaphragm and did not engage in the pelvis. This, of course, necessitated all kinds of violent proceedings in order to accomplish delivery, followed in several of the cases by death.

I had already performed the operation once before I read the description of it, and in that one I sewed the anterior surface of the uterus to the abdominal wall, and when a little later I read that the posterior surface was being attached to the abdominal wall, I thought that it must be a typographical error, so that I never once performed the operation in that way.

About five years ago I collected a large number of cases of pregnancy after ventrofixation, nine of which were operated on by myself. I was informed by the doctors who had sent me these women, that one had a miscarriage at the third month, and that all the others went on to full time and normal delivery, the only symptom referable to their operation being some pain and dragging on the artificial adhesions during the last month. But as far as the labor was concerned, there was absolutely nothing to indicate that ventrofixation had been performed.

During the last five years, since my collective investigation was published, I have been leaving a part of an ovary more and more often, and quite a number of these have become pregnant and have had a normal labor. Among these was one sent to me by Dr. Clarence R. Gray, of Montreal, and as he has written me an account of her case, and as it corresponds with what others have told me over the telephone, I cannot do better than give it here in his own words. "The patient, a Mrs. W., was admitted to the Western Hospital, and operated by you on August 6, 1904. Besides a ventrofixation she had a cystic ovary removed. She made a good recovery, and became pregnant February 1, 1905. She suffered from abdominal pains during the first four months, after which they gradually diminished, and during the last month or so of her pregnancy she was fairly comfortable. The pain was of a cramp-like character, mostly confined to the lower abdominal zone, and was increased by walking.

"False labor came on October 2, 1905, and although she had a few real strong uterine contractions, the os became very slightly dilated. This trouble was probably due to severe vomiting, caused by an attack of indigestion. Labor set in on November 16, 1905. During the night she stated that she had a severe abdominal pain, constant in character, which lasted until 7 A.M., when after half a dozen severe uterine contractions, labor was terminated at 8 A.M.

"There was no tear, no trouble with the placenta, and the uterus kept well contracted. She was kept in bed sixteen days, and at the present time she feels well and has no symptoms referable to the pelvic region. The baby weighed eight and a half pounds. To sum up: there seemed to be some trouble until the uterus became an abdominal organ, but there was no interference with labor or the subsequent involution of the uterus." As the patient was a highly nervous woman, Dr. Gray thinks we might take a little off her estimate of the amount of pain, which he thinks was not very severe.

In conclusion I might state my present attitude very briefly as follows:

1. In all cases in which the retroversion is the only lesion, and when I am certain there are no adhesions, I do an Alexander.
2. The only modification I have made in the technique of the Alexander operation, after having done over three hundred of them, is to cross one ligament under the skin, tying the

two ligaments with a reef knot opposite the right external inguinal ring, which knot is secured from slipping by a few fine catgut stitches.

3. My success with my first case of ventrofixation, fifteen years ago, and the satisfaction I have had with almost all of the others, has convinced me that nothing so far proposed can give better results than the method I have employed in over three hundred cases, viz: to scarify a space an inch in diameter on the anterior surface of the fundus; to do the same to the corresponding abdominal peritoneum, and to anchor the uterus by two chromicized catgut stitches passing through peritoneum, muscle and fascia on both sides, and deep in the uterine wall. These stitches must last a month.

4. In both Alexander and ventrofixation operations it is important to amputate the cervix, if it is too long, so as to leave the uterus only two and a half inches deep, and thus lighten the load to be carried by the shortened ligaments or by the adhesions.

248 BISHOP STREET.

A GENERAL SURGEON'S VIEWS ON SOME PELVIC CONDITIONS IN WOMEN.*

By

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THIS paper, so-called, will consist rather of somewhat rambling remarks on three or four subjects which came to my mind at the moment when Dr. Wilson's letter was received. Two papers which I had just read, by Drs. MacNutt and Thomson, upon "Non-Operative Gynecology" and "The Causes for the Functional Neuroses," brought to mind a good many points which appeal to the general surgeon and which did not interest me so much in the days when my interest was fixed more on gynecological subjects. Some twenty years ago, when we were all engaged in the new gynecology and all interested in new operative procedures, we had a quick road to recovery for many of our patients who had in former years gone the rounds of the gynecologists' offices and who had become chronic patients. Some of our results were bril-

*Read before the Section on Gynecology of the College of Physicians of Philadelphia, January 18, 1906.

liant, and some, under the most approved methods of antiseptic and aseptic treatment, with all of the resources which we could employ, were bitter disappointments. We did not then realize why we were destined to be so sadly disappointed in many cases in which brilliant results had been anticipated. Our new gynecology had abrupt limitations, and it is only of late years that we have learned why some of these limitations were so abrupt. My work later became that of the general surgeon, owing to various hospital and other positions, and it became clear to me that in the work of analysis and elimination in making diagnoses one can easily be too special in focusing the attention upon the pelvis. In a certain group of cases of young women who come for gynecological treatment, many cases are not suitable for operative treatment at all. Among these are many young women with flexion, malpositions, with certain ovarian neuralgias. Instead of looking at the uterus first, I try to locate the difficulty at a distant point and think of the uterus after the patient has been under treatment for a week or a month in the hands of such specialists as I wish to employ. In some cities surgeons tell me that they do not have a free hand to employ different specialists in arriving at a diagnosis. In my work in New York I find it practicable, and the patients who will allow it make the most satisfactory clientele. In a young woman presenting herself with a flexion, I am apt to assume that it is not a diagnostic entity, but a symptom, as a cough or sneeze would be. We must ascertain, then, whether a flexion of the uterus stands in the same relation to the condition as a cough or sneeze, and to do this we must, first, examine the peripheral irritators. I think that which perhaps stands first among the young women in the group of peripheral irritators is eyestrain. In this examination you should note whether one eyebrow is elevated above the other, whether the eyebrows are flattened or highly arched. Note also wrinkles or corrugations of the skin of the forehead. Notice the external evidence of eyestrain, and say to the patient that you would like that possible factor eliminated. This may subject a man to some criticism. It is, however, rational, and many patients to-day will allow it who would not ten years ago. In eliminating this possible factor of eyestrain, it is extremely important to have the proper man make the examination. Two weeks ago, owing to certain influences, I sent a young woman with a flexion to a renowned ophthalmologist in New York whom I knew of as a famous man, but not in this particular field of eyestrain. He sent

back a report that her sight was perfect. I wrote him that I cared nothing about the sight, but desired to know whether she had any muscular insufficiency which was serving as a peripheral irritator, and asked him to make a special appointment and give the patient such time and service as he was able. He did so, and found a great deal requiring attention, and is at work upon her yet, although his first report was supposed to be final. The patient is getting better, and I doubt whether we shall have to go beyond the eyestrain to account for the "cough" in her pelvis.

Normal involution of the appendix is another producer of pelvic symptoms. In regard to involution change which the appendix undergoes, it is to be noted that the mucosa is replaced by connective tissue, and that the contracting connective tissue pinches the terminal filaments of sensory nerves. I made a series of microscopical sections and examinations, and found that the nerve tissue retained its integrity longer than any other one structure in this involution appendix, and that the nerve filaments were surrounded with such groups of young cells as would indicate an irritative process going on. Carrying this observation into the field of clinical work, I found that many people who suffered from rather indefinite pelvic pains, ovarian neuralgia, and dysmenorrhea, had a tender involution appendix. This matter was worked out in its logical bearings by the removal of the appendix and in proper cases there was a cure of pelvic symptoms.

I would not be misunderstood to say that eyestrain and normal involution of the appendix form a predominant proportion of cases in which we have pelvic symptoms without other evident cause; but they form a sufficiently large percentage to make their elimination necessary.

In another group of cases symptoms are due to intoxication from metabolic faults proceeding from disturbance of the liver, commonly from the results of a chronic cholecystitis. This has been much overlooked. Most of us have had at various times cholecystitis from the colon bacillus being taken up from the bowel and through the afferent vessels of the portal system carried to the liver, and on the way out giving rise to various catarrhs which have passed under different diagnoses aimed at the liver. In many of these cases the throwing out of lymph about the gall-bladder and bile ducts results in adhesions which cause great functional derangement of the digestive apparatus, and with this, neuralgias which commonly make different demonstrations in the pelves of women who are not resistant.

A group of cases with gynecological symptoms is the one formed by enteroptosis, or loose kidney cases. The latter will form a part of our gynecological clientele in which the most painful demonstration is made in the pelvis, and these cases must be eliminated. In making a diagnosis of the possible symptoms of any one of these groups of peripheral irritators, we must have a clue for making our elimination. On either side of the navel we find the lumbar plexus, and upon making pressure with a finger upon a lumbar plexus we find it more tender than surrounding tissue. If we have irritation proceeding from eyestrain, neither one of the lumbar plexuses will be hypersensitive. If we have pelvic symptoms arising from an involution of the appendix, the right lumbar plexus will be extremely tender on pressure, *always and all the time*; on the right side only and not on the left. If the irritation proceeds from the pelvis, it makes no difference whether it proceeds from the right side or from the left, both lumbar plexuses will be tender *always and all the time*; both, not one. This is a point that can be brought out readily in the office, and so distinctly and clearly that it indicates the way we are to go in making our elimination. So that, as a general surgeon looking for a cause for a flexion, I would eliminate eyestrain, eliminate normal involution of the appendix, eliminate infection of the uterus or adnexa, or gall-bladder. In the gall-bladder cases with adhesions, we usually find that neither of the lumbar plexuses is sensitive. Rule out the lumbar plexuses for eyestrain and gall-bladder affection; rule in both for any special irritation arising from the uterus or the adnexa; rule in the right lumbar plexus tenderness in normal appendix involution cases.

When engaged in early gynecological work I felt that leucorrheas were diagnostic entities and were to be treated as such. I felt that I must put the uterus into position; that I must treat the endometrium often by local measures, when to-day I would not try it at all. We will sometimes find that a very persistent leucorrhea is due to the colon bacillus making its way into the vagina and using as a culture medium the secretion from the endometrium in a young woman whose general strength is being sapped by some peripheral irritator, or by the character of her work.

The next subject which I wish to bring up for discussion is the advantage of certain conservative work upon the adnexa. It seems to me that, as a gynecologist, I removed too many organs and was too much inclined to sacrifice the uterus, and I now believe that

conservative work may be done, based upon principles which I believe to be important. One of these is ovarian grafting, if we can graft from the patient herself. Grafting from one patient to another is not successful, because the tissues of one individual are intolerant to the tissues of another, and undergo absorption. We can frequently do conservative work by saving part of an ovary from the patient whose injured adnexa we have removed and grafting this beneath the peritoneum of the same patient. This patient is tolerant of her own tissue. Cases in which the menopause would be precipitated with injurious results can thus be postponed. This is one of the features in gynecological work which I believe to be very important and which has not yet received as much attention as it should at the hands of gynecologists.

Another point in conservative work along general surgical lines is the prevention of recurrence of adhesions. Very much can be done by the use of the aristol film, which makes a tenacious lymph coagulum, presenting a mechanical obstacle to readhesion. This will clear up a good many cases in which adhesion is certain to occur under other methods of treatment. The use of an animal membrane for preventing adhesions was first suggested by Dr. Fritz Baum of St. Louis, but he did not carry it into practical work in this field. Dr. Cargile of Bentonville, Arkansas, had the peritoneum of the ox sterilized for the purpose, and with Cargile's membrane properly used we can now prevent secondary adhesion formations in many of the cases in which parts of the adnexa would commonly be sacrificed.

It seems to me that these two resources could be employed much more frequently than they are.

RADIUM THERAPY IN PEDIATRICS AND GYNECOLOGY.*

BY

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WHILE the benefits of radium therapy are seen more clearly in the domains of the dermatologist and general surgeon, still enough has been done in conditions of interest to the pediatricist

*Read before the Washington Obstetrical and Gynecological Society, January 5, 1906.

and gynecologist to warrant bringing the subject to the attention of the members of this society.

A word or two as to the preparations of radium and the methods of applying them may be helpful in understanding its uses. The preparations first put on the market in Paris by the Curies were very weak, impure specimens. They had an activity or strength about three hundred times as great as the metal uranium, measured by the rate at which it discharged a charged electroscope. The best of the recent preparations have had an activity of from 300,000 to 1,000,000 or more times that of the uranium, so the effects produced have been multiplied a thousand times or more. There has been considerable variation, moreover, in the quality of the specimens that are said to be of these high activities. The preparations of one firm in Hamburg and another in Braunschweig seeming to be more uniformly of high grade than that coming from Paris from the firm that manufactures under the supervision of the Curies. Still another factor which must be taken into consideration in estimating the value of radium therapy is the individual reaction of each patient. Two conditions which clinically appear the same and are treated in the same way with the same preparation of radium may react very differently, one responding well and the other showing practically no response.

A point which elicits many queries from those who have not done any work with radiotherapy is the method of applying the radium. The salt itself is not consumed in the applications. Only the radiations which are constantly being given off are used. Of these radiations the alpha rays, which are in the greatest quantity, have but slight penetration; the beta rays, smaller in quantity, have much greater penetration, while the gamma rays have tremendous penetration, but are very few in number. Now, if the radium is kept in a glass tube, all of the gamma, most of the beta, and perhaps some of the alpha rays will penetrate the glass and be accessible for use; a great deal, of course, will depend on the quality of the glass and its thickness. If the radium is kept in an aluminum container (which is of less density than the glass and can, with safety to its contents, be made thinner than glass) all of the beta and perhaps some of the alpha rays become available for use. And in a case with a mica disc for a cover the mica can be split so thin that a still larger proportion of the alpha rays becomes available. I have used an aluminum tube as a container for stricture work, applications to the cervix,

etc., and the flat mica-covered box for surface work. The glass container is satisfactory even when containing weak radium for analgesic work.

Before speaking of the treatment of diseased conditions, a few words as to one or two of the effects of radium that have not yet been applied therapeutically, may be of interest. It has been shown by experimentation on animals that radium, like the x -ray, produces sterility in both the male and the female. In male animals the spermatozoa are no longer produced, but although azoöspemia results, there is no modification of the sexual feelings. In the female the Graaffian follicles no longer ripen. So when animals that have been treated with radium have connection with normal animals, they produce no offspring although their sexual desires do not seem to be in any way modified. This sterility, however, in the cases reported, has been but temporary, fertility returning again in the course of a few months. Whether longer exposures would produce a complete and permanent sterility has not yet been demonstrated.

Another point of interest is the change in development that occurs in eggs that are incubated and at the same time exposed to radium. In every one of eighty hen's eggs exposed to radium in this way, examination during the period of development showed absent or late development of the protovertebræ, retarded development of the ectoblast, and active proliferation of the hypoblast. Similar results were obtained in the development of the worm and frog larvæ exposed by Bohn. In all the cases the action of the radium seems to be upon the growing tissues. The more rapidly the tissues are developing the more noticeable the effect of the radium.

To come now to the application of radium in pathological conditions, the pediatricist, and probably all of us, will be interested in the report of a number of cases of birthmarks that have been treated with radium. Both the pigment moles and the hairy moles respond well to the action of radium, disappearing completely, and leaving practically no scar, but a soft pliable skin. The cosmetic results are better than those obtained by any other method of treatment.

Of the vascular nevi the two types, one composed of capillary vessels and the other of cavernous sinuses, may be distinguished by their response to treatment as well as by their pathology. Both forms disappear readily, and leave the same soft, pliable tissue

that follows in the cases of the other birthmarks. In the capillary nevi, however, only the areas exposed directly to the rays in the immediate vicinity of the radium receptacle are affected. In the nevi composed of cavernous sinuses the healing takes place in the entire area involved. One such case reported by Pollard is interesting enough to mention in detail. This cavernous angioma was present at birth and increased in size till the child was five and a half months old, when it became of constant size, but continued to increase in thickness. At the time of treatment it covered the right half of the face, closing the eye; was of a spongy consistency, and had several small ulcers on the surface. It invaded the mouth, and though the glottis was free, there was an irritant cough which pointed to involvement of the pharynx. Several isolated areas were exposed to the action of radium for five to six hours at one application. In the course of two weeks there developed necroses that needed three months to heal, and with this the angioma in "its full extent began to sink in and grow pale." The cicatrix extended until the right eye could be opened. In the next four weeks the entire angioma decreased markedly, with the extension of the scar and marked paling. The mucous portion of the growth also became smaller and the child lost its cough. By the time the ulcers caused by the radium application had healed, the angioma was everywhere flattened and appeared only as a "pale birthmark." In this case the scar formation began at a distance from the points of application of the radium, while the ulcers caused by the radium were still increasing. This metastatic effect of the radium applications is explained by the setting up in the endothelium of the blood spaces of an endophlebitis which causes coagulation of the blood in the tissues near to the exposed area, so that circulation is impeded and thrombi formed which extend through all the large blood spaces even to the places where the endothelium is not harmed, as we see in the inflamed varicose veins. Then there follows organization of the blood clot and healing of the cavernous angioma. There is no such extension of the effect of the radium in the flat capillary nevi because there are nowhere the large blood spaces that make possible the extension of the thrombi. In the case quoted there was not a complete, permanent cure. Three months later the child was seen and a new angioma had formed around the edges of the primary one. The scars of the radium ulcers remained free from recurrence.

The beautiful results that follow the treatment of lupus vulgaris and the encouraging results that follow the treatment of keloids belong rather to the domain of the dermatologist.

In the realm of the gynecologist the benefits of radium are not so strikingly shown because the surgical treatment of early cancer is so satisfactory and so well established that practically only the late inoperable cases have been subjected to radium. These late cases have only been helped, not cured by the radium, although complete disappearance of isolated metastatic nodules has been repeatedly shown, especially in connection with cancer of the breast. One case of what was in all probability early cancer of the cervix has been reported as cured. The case was under the care of Dr. Robert Abbe of New York. The section removed from the cervix was pronounced epithelioma by the pathologist, Dr. F. C. Wood. The radium tube was inserted into the cervix on two occasions for about twelve hours. This set up a severe degree of inflammation with a free discharge of mucus. When the patient was again seen several months later there was no indication of a malignant growth. A section of the tissue was again removed and submitted to Dr. Wood, who reported that it showed normal tissue only. The patient has thus far remained free from recurrence. The cases that have come under my attention have all been late cases, and in them the results of treatment have been seen only in the relief of pain, discharge, and bleeding and a return of a certain amount of strength, flesh and appetite. The first case came under my treatment, thanks to our secretary, Dr. G. Brown Miller, before the strong preparations of radium were available. Here a tube containing radium with an activity of about 300 was inserted into the vagina, which was already much involved, and left in place two hours at a time every day. There was some relief from the pain and an absence of bleeding, which before the use of the radium had been pretty constant, until the radium applications were discontinued. Another case, also referred to me by Dr. Miller, was treated with radium of 1,000,000 activity with two applications a week, each for one hour. She had marked relief from the pain, discharge and hemorrhage. She gained strength and flesh temporarily and her color improved distinctly. In the course of six months, however, she began to go down hill again. Two recent cases referred to me by Dr. I. S. Stone were very different in their reaction to radium treatment. Both were considered inoperable when he first saw them, but he had removed

as much as possible of the mass with the cautery. The first case he considered the more hopeful of the two. She received four applications of the strongest radium for six hours at a time at intervals of a week. There was apparently no effect. She also failed to respond to subsequent x -ray treatment, getting practically no relief from her pain. The second case had combined x -ray and radium treatment; was much relieved from pain and had practically no more discharge or hemorrhage. She gained so much in strength as to make the family think she was on the high road to recovery, but the local lesion continued steadily to increase in its periphery.

Two cases of cancer of the rectum, both inoperable, have been interesting. In the first one there was a stenosis that would barely admit the passage of the tube of radium five millimeters in diameter. There were obstruction symptoms, and a persistent discharge of mucus streaked with blood. After introducing the tube of strong radium into the stricture for an hour three times a week, at the end of a month the obstruction symptoms were much improved; the bowels moved at times with a formed movement and with practically no straining. The discharge of mucus and blood had entirely ceased and on examination the stricture admitted the tip of the finger. Two months later when the obstructive symptoms were beginning again the treatment was repeated with improvement the second time. Hope of cure at any time was not entertained, because the inguinal glands had been involved for several months before radium was employed. I feel satisfied that the radium treatment in this case saved the patient the very disagreeable months that would have followed a colostomy, and at the same time prolonged life. The second case had the discharge and the cachexia, and a stricture that admitted the finger with difficulty. I felt that nothing curative could be done and that the obstructive symptoms scarcely justified as yet any local treatment. However, at the solicitation of the family who felt that refusal to treat the woman would mean despondency or resort to some quack who would promise a cure, the treatment was undertaken and the considerable improvement in the woman's general condition, even though it is only temporary, has seemed to justify the treatment. This class of cases, where without radium the treatment has been colostomy with its after-conditions so disgusting to the patient, certainly is better treated by radium than by any other method. Somewhat parallel are cases of carcinoma

of the esophagus where the stricture can be dilated by the introduction of the tube of radium and the patient saved the discomforts of a gastrostomy.

To summarize, radium gives the most satisfactory results in the treatment of birthmarks, lupus and keloids. It is helpful in the late cases of cancer of the uterus to palliate some of the symptoms, and may probably be curative in the very early stages. It is the most desirable treatment of inoperable strictures of the rectum and esophagus, where it gives more comfort to the patient than colostomy or gastrostomy.

1539 I STREET, N. W.

SOME OF THE SURGICAL CONDITIONS OF THE PUERPERIUM.

BY

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In practice, obstetrics at present lies at the border line between surgery and medicine. Its underlying principles, however, are essentially surgical, and complications may arise during the lying-in period which can be met only by one accustomed to surgery. Some of those which may occur during the puerperium, that indefinite period beginning immediately after the birth of the placenta, make the subject-matter of the following article.

As the puerperium begins immediately at the close of the confinement proper, the first question that confronts one is that of the repair of the tears in the perineum. Unless some especial contraindication exists every tear should be immediately repaired. It is much safer to adhere to the rule of putting a stitch in every tear, no matter how slight, than to run the risk, through leaving any unrepaired, of lessening the support of the pelvic organs. Without entering into the minute details of how the perineum gives way there are practically two types of tear depending on the condition of the sphincter ani, whether it is intact or torn. Repair of the first form of tear, where the sphincter is intact, is by sutures passed from one side of the torn perineum, curving well up so that the body of the perineum is caught, across the tear through a corresponding spot in the body of the perineum

on the other side and out through the skin. The sutures should pierce the skin about one-half to three-fourths of an inch from the tear and should be of non-absorbable material, as they are to remain in place 8 to 10 days. I use silkworm gut sutures and place them by a curved handled needle. Unless one is very skillful a finger in the rectum is of great aid. It serves to guide the suture, preventing perforation of the rectal wall, and to pull down the upper part of the perineum by everting the tear so that its body is more easily caught in the sutures and a good support ensured. These sutures should be tied without much strain because of the possibility of considerable subsequent swelling from the trauma of the labor. These external stitches, when tied, approximate the edges of the tear so satisfactorily that the portion within the vagina usually requires none of its own. Should the sphincter muscle be torn, as the first step in the operation its divided ends must be sutured. Catgut should be used, for, when the perineum itself is repaired, the second step as described above, these stitches will be entirely buried. The material must therefore be absorbable. When the rectum is torn as well as the sphincter the edges of the torn rectal wall must first be united by catgut sutures, continuous or interrupted as preferred, beginning at the highest part of the tear and working downward till the sphincter is reached, when the sutures include that also. The silkworm gut sutures are then placed in the perineum as before. When repairing these perineal tears care should be given to making a new perineum that will have as much supporting body as the original. The repair of the skin alone may look well, but is valueless. The ends of the silkworm gut sutures are left long and tied together. They can be kept from constantly pricking the patient by winding the collected ends with sterile gauze. With the ends of the sutures tied together it makes it impossible to leave one behind when they are removed. My custom is to use no dusting powders on the sutures but to have the stitches kept as dry and clean as possible. Occasionally, after a long, hard labor, there is considerable swelling of the perineum. If this becomes so great as to endanger the stitches ice should be applied over the vaginal pad. It is unnecessary with any tear to tie the patient's knees together, though it is advisable, with very extensive lacerations, to caution the woman against flexing one leg while the other is still straight. It is only with tears of the second type, where the sphincter and perhaps the rectum have been repaired, that

it is advisable to prevent a movement of the bowels for a few days—the exact number depending on the extent of the tear—by keeping the patient on a diet of liquids without milk, and laudanum, 5 to 10 drops t.i.d., as may be necessary.

In regard to the advisability of immediately repairing cervical tears there is not such an unanimous opinion as exists toward perineal tears. An occasional text-book advises the immediate repair of a lacerated cervix, but most agree that it is far better to do later a secondary operation. The most common tears of the cervix are bilateral. Of 600 cases whose records were examined at the Boston Lying-In Hospital, 464 had bilateral tears, 66 stellate and 64 unilateral. Tears of the cervix, even when extensive, heal spontaneously with surprisingly good results. While one should be perfectly sure of his aseptic technique, there is no doubt that the less intravaginal work done the less the chance of infection, the possibility of which is greatly increased by the bruised and edematous condition of the cervix. This swelling of the parts makes the proper approximation of the edges of the tears so difficult that the probability of getting a good result from an immediate repair operation is far less than from a secondary. A tear in the cervix exists in practically every woman who has borne a child, but causes symptoms in comparatively few. For these reasons I do not believe in the immediate operation. Rarely an author who is opposed to the immediate operation advocates a secondary after a few days, that the convalescence of the confinement and the repair operation may coincide and time be thus saved for the woman. I disbelieve in this choice of time, for cases of severe lacerations of the cervix which would without any doubt require repair at some time occur practically always from hard instrumental deliveries. In these the convalescence is often at first not smooth. I should be loath to operate within a few days of the confinement on such a case because of the possible effects of the anesthetic on her general condition. It has been recently shown that a second etherization is not borne well if it closely follows the first. (Müller, *Arch. f. Klin. Chir.*, 1905, No. LXXV., p 876.) The cervix, therefore, in my opinion should be repaired only after an indefinite period. In many women it will be unnecessary at any time. There is, however, one condition where a suture in a torn cervix is a necessity. When the tear is so extensive that the circular artery of the cervix is divided there is a post-partum hemorrhage which may become alarming. The

customary manner of meeting this emergency is to pass a catgut suture through the tear in the cervix and tie it sufficiently tight to control the bleeding. Occasionally the vessel can be caught with a hemostat and ligated. At the Boston Lying-In Hospital, of 83 cases of post partum hemorrhage 13 alone were due to tears in the cervix where the bleeding was stopped by suture or ligature.

Tears at the side of the vagina usually heal satisfactorily without any extensive suturing. A catgut suture here and there simply to approximate the parts is all that is necessary. Here again the less work done in the vagina the better. These cases of bad tears necessarily occur in difficult labors. The torn parts are bruised and swollen and are below par to withstand infection.

Before considering the cases of true sepsis there is a condition which, if untreated, leads to sepsis and should therefore be mentioned first. Occasionally there is a sudden cessation of the lochia, slight rise in the temperature, slight uterine tenderness accompanied by slight malaise, due to an obstruction of the cervix which dams up the flow, backing it up into the uterus. If this condition is left untreated the chances for a true uterine sepsis are excellent, for there could be no better medium for bacterial growth than the stagnant lochia. The treatment is obvious—a removal of the obstruction, allowing free drainage for the lochia. An intrauterine douche or a gentle curettage does this satisfactorily. This condition may be met with at any period during the continuance of the lochia. It is, of course, met more often early than late, when the discharge of a bit of clot or membrane is more common, either one of which might be sufficient to block up the cervix.

It will be impossible to enter into a complete discussion in this paper of the various forms of sepsis following labor. It is, however, worth while to touch on a few points. No matter in what part of the reproductive organs the infection lies its severity depends largely on the form of bacteria present. In a general way the infection from streptococci is very virulent, that from staphylococci less so, and that from colon bacilli and the gonococcus least. There are, of course, variations in the virulence of a given form of bacteria, but, in a general way again, the streptococcus tends to rapidly invade the various organs and the gonococcus to remain fairly well localized.

Infection may occur through any of the lacerations of the perineum or vagina. If it occurs in the perineum, the stitches should

be removed and the tear spread open, cleaned and allowed to heal by granulation. Should the infection occur in the vagina, vaginal douches, or, in the more severe cases, thorough wiping out with some antiseptic with the aid of a speculum, will usually suffice. Infection in the cervical canal is indistinguishable at first from that in the uterus. Deferring treatment to learn by the subsequent symptoms its exact site is to be condemned. Treatment should be instituted at once as though the symptoms were due to the more serious condition—*i.e.*, uterine infection. In considering the treatment of uterine sepsis one meets immediately the question of the superiority of the intrauterine douche or the curette. Personally I favor the use of the curette as more efficient. I feel that if any interference within the uterus is necessary, the douche may benefit but may often be not sufficient, making curettage a necessity later after the loss of valuable time, while a thorough scraping at once with a large, dull curette followed by an intrauterine douche will ordinarily remove all septic material. A daily intrauterine douche may then be required for a short time. My custom in hospital practice is to recommend curettage when, during the first days of the puerperium, the patient develops a temperature, even though slight, which cannot be accounted for, accompanied with uterine tenderness. I feel that the immediate emptying of the uterus of any retained membranes or septic material done once thoroughly will in many cases prevent further trouble, while if time is spent waiting for a definite diagnosis the sepsis makes considerable headway, the patient becomes more poisoned, and the condition does not therefore yield so readily to treatment. By waiting, without doubt, a few patients whom I now curette would escape any interference at all, but I look upon the operation, when conducted with proper aseptic technique, as entirely without danger and believe the risks of an immediate, perhaps unnecessary, operation are less than those of a later possible sepsis. No ether is necessary. If, after the curettage, an intrauterine douche of corrosive sublimate is given, care should be taken to wash out the corrosive with boiled water or salt solution. The uterus has been known to retain sufficient amount of the corrosive to cause, through absorption, very unpleasant symptoms of mercurial poisoning.

The extension of the sepsis beyond the uterus causes inflammation of the broad ligament or the tube. The rarity of this complication when the treatment for uterine sepsis is properly

carried out is shown by the following figures. By reference to the cases at the Boston Lying-In Hospital where some intrauterine interference (douche or curettage) was deemed necessary because of sepsis, I find 80 cases since the fall of 1893. The record of 62 of these 80 cases contained nothing to suggest the extension of the process; no mention of any lateral tenderness or mass was made. In 12 cases there was such a suggestion without any definite statement about the presence of a mass. In only 6 out of the 80 was a definite mass felt, due either to a salpingitis or a parametritis. It is not at all uncommon for a chronic inflammation of the tube, existing before the labor, to undergo an exacerbation during the puerperium due to the trauma of the uterine contractions of labor. Of the 12 cases where there was a suggestion without definite proof of a lateral extension of the inflammation, there were 3 due to the exacerbation of an old process, and among the 6 where a mass was really felt there was 1 such case. While all statistics are liable to be misleading, these figures show that with proper care the risk of an extension to the tubes or broad ligament of the uterine infection is slight.

Should a mass develop on either side of the uterus with the accompanying evidences of an extending infection, conservative treatment will ordinarily quiet the whole process. The application of hot flaxseed poultices to the abdomen, free catharsis, hot vaginal douches and the continuation of the treatment for the uterine sepsis usually suffice. If the process continues to extend and the mass, by vaginal examination, becomes boggy with the evidences of pus, a vaginal section should be performed and the pus cavity drained. The mucous membrane of the vagina is incised in the median line, transversely, on the posterior aspect of the cavity. By blunt dissection this is separated from the cervix, keeping close to the uterus that the peritoneal cavity may not be opened. When the mass is felt on the side it should be opened by blunt dissection and the pus cavity washed out and drained with a tube. Of the six cases where a mass developed only one progressed in spite of treatment and required section. One other of the six went home against advice with the mass still present, so that in this case the end result is unknown. It has been learned by subsequent laparotomies on these cases of salpingitis or parametritis that the pelvic organs, in a large proportion of the cases, became eventually perfectly normal in appearance.

I have made no mention of serum therapy, for it is not yet sufficiently satisfactory to warrant the abandonment of surgical measures for combating sepsis.

There is a rather rare condition which may at times be confounded with sepsis. If a fibroid is connected with the uterus in such a way that its blood supply is shut off by the involution of the uterus during the puerperium it becomes more or less necrotic. The symptoms are much the same as those of sepsis, while the physical examination differentiates the two by the presence of the tumor. If the fibroid is subserous it may cause abdominal symptoms and require very nice judgment in regard to the advisability of operative interference and the removal of the tumor. If the fibroid is submucous it may be spontaneously discharged after having sloughed off. Of twenty-six women with fibroids, confined at the Boston Lying-In Hospital, none had a convalescence of any especial note. These figures show that the condition is rarely met with. The remembrance of the possibility of such a complication may, however, be of benefit in a doubtful case.

The strangulation of an ovarian tumor may follow the confinement in a few days. The rearrangement of the abdominal and pelvic organs, dependent on the birth of the child, may lead to the twisting of its pedicle with consequent strangulation. Such a case was recently seen where the woman had all the symptoms of intestinal obstruction. A laparotomy was done and an ovarian tumor with a twisted pedicle found.

One more uterine condition must be mentioned, not because of its frequency, but because of its great malignancy, deciduoma malignum. The one symptom most characteristic of this disease is hemorrhage from the uterus. Although it is rare for deciduoma malignum to develop within the first few weeks after the confinement, any extraordinary loss of blood at this time, if unexplained, should be considered sufficiently serious to warrant a curettage and microscopic examination of the scrapings. This tumor is of exceeding malignancy and often of rapid growth, and the only hope of cure is from an early operation—complete hysterectomy.

A breast abscess should be incised so early and in such a way that the least possible amount of gland tissue may be destroyed by the burrowing pus or the incision itself. Any mass which persists in spite of conservative treatment (cessation of nursing, ice coil, breast bandage, saline laxatives) should be watched with

the greatest care, and on the slightest evidence of increase in size or tenderness, the range of temperature being of least importance, should be explored. It is wrong to wait for definite fluctuation to appear in such a mass, for the delay means the destruction of just so much more breast tissue. Clean cuts will destroy less tissue than the extension of the process which finally, by giving the sense of fluctuation, makes the diagnosis exact.

There are two methods of dealing with a breast abscess, the object being the same—to give and maintain free drainage. One method of operating is to make various incisions into the abscess, each one radiating from the areola running parallel with the ducts and thus cutting off no more of them than absolutely necessary. The other method is to incise the skin below the breast, at its junction with the chest wall, as if an amputation of the breast itself were to be done, and then to separate the breast tissue from the pectoral muscle and open the abscess from behind, establishing drainage behind the breast and out through the skin incision. This method is recommended for cosmetic reasons, that the breast may not be riddled with unsightly scars. In either case one should be sure that every side pocket has been opened and free drainage established. No other form of abscess is so apt to have various extensions and break out in fresh places. The abscess should be thoroughly washed out and drained with tubes placed in various directions. The tubes should be left in position till the flow has markedly lessened, when gauze drains may be substituted. The resulting sinuses should be allowed to heal only slowly, that healing from the bottom may be ensured and any chance of blocking up the discharge reduced to the minimum.

TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

Meeting of February 13, 1906.

The President, LeROY BROUN, M.D., in the Chair.

DR. H. C. TAYLOR read a paper entitled

LEUCOCYTE COUNTS IN GYNECOLOGY.*

DR. B. C. HIRST of Philadelphia (guest) opened the discussion. He thought the leucocyte count in gynecology could not be depended upon too much, as he had been disappointed in several instances, for example, in making the differential diagnosis between tubal pregnancy and suppurative salpingitis. In other cases, however, it had been of distinct value. In obstetrics, he thought it of less value than is generally supposed. He had seen a number of severe puerperal infections in which the blood count had given no information, although in the average case the leucocytosis is high. He considered an estimation of the red cells and the amount of hemoglobin to be of great value. In one case of severe anemia and hemoglobinemia, following severe mental shock in delivery, an operation for repair of the genital tract was deferred until improvement was seen in the blood count. He had found blood cultures of the greatest assistance in clinical work. In 35 cases of infection after childbirth, abortion, and gynecological operations, they had not once failed to indicate the true condition. Intra-uterine cultures, however, had been negative in four cases, in which the operative and post-mortem evidence showed the blood cultures to be correct. One puerperal case, suspected to be typhoid and from which a positive Widal was obtained, was diagnosticated on the medical side to be a streptococcus infection. After being transferred again to the maternity service blood cultures showed the presence of the bacillus typhosus, which was also present in the lochia.

DR. W. R. NICHOLSON of Philadelphia (guest) stated that the work in the University of Pennsylvania had shown the inter-independence of intrauterine and blood cultures. He thought much of the discrepancy, particularly among the earlier workers, was due to faulty technique. He does not believe it is always possible to determine, from intrauterine cultures, whether a case is septic or not, nor will they enable us to greatly modify our plan of treatment, but they may be helpful in diagnosis. He considered it more difficult to make trustworthy intrauterine cultures than blood cultures, because of

*See original article, page 64 .

the dangers of contamination from a tract so difficult to render sterile. He thought a skilled bacteriologist was as necessary for taking the cultures as for doing the laboratory work. He concluded that the lack of uniformity in results obtained by different observers was due (1) to lack of care in the choice of the so-called normal cases; (2) to the employment of a poor technique. He then described his own technique, in which, in place of the Döderlein tube or any of its modifications, a cervical speculum was used as an outer sheath to prevent contamination from the cervix.

DR. F. L. SONDERN (guest) thought Dr. Taylor's results bore out, in a general way, his own claims, based upon 1,700 surgical cases, that the estimation of the relative percentage of the polynuclear cells is of more importance than the knowledge of the leucocyte count alone. The difference in the causation of the leucocytosis and the polynuclear increase should always be borne in mind, the former showing the resistance offered by the animal economy to the infection, the latter being due to the absorption of the toxic material. If the pus or inflammatory exudate, although large in amount, is surrounded by dense fibrous tissue, no absorption of the toxic material occurs and no rise of the polynuclear cells results. This is especially true in the pelvis. A fall in both means improvement, but in the worst cases a fall in the total count, the polynuclear cells remaining the same, is indicative of exhaust resistance. Inaccurate results may, of course, be due to faulty technique. He considers blood cultures to be a most valuable aid in exact diagnosis, the former negative results being due to the bactericidal action of the blood when placed in insufficient amount of culture medium. Extensive dilution is necessary. He said that at Bellevue Hospital, for example, the early diagnosis of typhoid fever is being made more constantly with the cultures than by the Widal test. He thought that in pregnancy, on account of the frequency of grave anemia, more attention should be paid to examination of the blood. The detrimental result to the rapidly-growing fetus might account for the sub-standard of many infants.

DR. H. J. BOLDT expressed surprise at the positive results obtained by Dr. Hirst from blood cultures in septic or supposed septic cases. An experience of three years with the present technique had been so disappointing to him that he had given up hope of coming to any definite conclusions in regard to their value.

DR. JOSEPH BRETTAUER said that in his service at the Mt. Sinai Hospital, the results of the examinations of the blood had not been entirely satisfactory. He had seen only one case with a positive blood culture recover. He had observed that a decrease in the leucocytes with increasing or stationary clinical symptoms is invariably indicative of a fatal termination.

DR. W. R. NICHOLSON, in closing, suggested that an insuf-

ficient dilution of the blood might account for some of Dr. Boldt's difficulties. He stated that he had never failed to get a positive blood culture in a truly septic case, though perhaps, not from the first examination. Positive blood cultures he considered of great value in the diagnosis of obscure cases. Positive blood and intrauterine cultures mean both a systemic and a local infection. A negative intrauterine, with a positive blood culture means a general infection with probably a uterine focus. If the blood is negative and the intrauterine culture is positive the sepsis is limited to the endometrium. If both are negative, the case is not one of sepsis, but of some general disease.

DR. TAYLOR, in concluding the discussion, said he thought the blood count of more value than the discussion would indicate, particularly in the prognosis of severe cases with rapid pulse and a marked pelvic exudate. A fall in the number of polynuclear cells indicates that the operation may be deferred.

PRESENTATION OF SPECIMENS.

DR. H. J. BOLDT presented the following specimens:

1. The appendix and tube removed from a patient, 24 years of age, who had been sick for three weeks with cramps in the abdomen, and "spotting" for eight weeks. A curettage performed four weeks previously for supposed retention of gestation products was not followed by relief of the pain. A diagnosis of tubal pregnancy seemed justified, although there were no evidences of a hematocele. The objective symptoms pointed to an appendicitis. Two days after the first observation, signs of a beginning hematocele determined an operation, in which the inflamed appendix was found adherent to the right pregnant tube.

2. A very large cystoma with universal adhesions, causing only frequent micturition and constipation. The typical facial expression of a large ovarian tumor was present.

3. A bilateral salpingo-oophoritis, simulating an extra-uterine pregnancy. The patient, 41 years of age, instead of the normal menstruation, had a severe attack of pain, which was followed for four weeks by cramp-like pains. A bilateral salpingitis nodosa was found, and an ovarian abscess of one side had given the physical signs of a hematocele.

4. A large ovarian cystoma with S twists of its pedicle and a twist of 25 degrees of the cervix, which was removed from a patient 31 years of age, very obese, and with no vaginal signs. She had had pain for six weeks. There were universal adhesions present.

5. Bilateral ovarian cystomata, from a patient, 28 years of age, who presented herself because of a supposed retroflexion and sterility. Both tumors filled the pelvis. A small zone of ovarian stroma in the right tumor was preserved and attached to the uterine horn.

DR. J. N. WEST said that he did not agree with Dr. Boldt's idea of preserving a portion of the ovary, if the seat of a large neoplasm, as he had seen a recurrence in several instances, in which this had been done.

TRANSACTIONS OF THE SECTION ON GYNECOLOGY OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Meeting of January 18, 1906.

The President, DR. W. REYNOLDS WILSON, in the Chair.

DR. ROBERT T. MORRIS read a paper on

A GENERAL SURGEON'S VIEWS ON SOME PELVIC CONDITIONS IN WOMEN.*

DR. JOHN G. CLARK.—Dr. Morris's statement as to the ease with which pelvic diseases may be differentiated from an appendical involvement by simple pressure upon one or the other side of the umbilicus cannot but strike one very forcibly, and we wonder how this law has been overlooked so long. I am apprehensive, however, that if this novel rule were generally followed, the majority of hypersensitive, neurotic women would sooner or later come to operation for trouble in one or the other locality, for I have seen very few patients of this class who, if you made sufficient pressure about the umbilicus, would not complain of pain. Even if this sign may have some weight in the diagnosis, I should still very much prefer to follow the classical symptoms which we have all learned to observe, associated with a thorough bimanual examination. If these are absent or fail to lead us to a differential diagnosis, I would hardly consider that it was justifiable to advise operation upon Dr. Morris's sign.

Dr. Morris has spoken of associating with himself a number of specialists, and said that by their aid all questionable symptoms are eliminated before he concentrates his attention upon the pelvic symptoms. While I am in entire accord with him in endeavoring to eliminate first any other condition, either general or remotely local, in my opinion we should try our skill first in reaching a diagnosis before referring our patient to this coterie of extramural specialists.

Again, I am not in accord with Dr. Morris's theory that eye-strain is such a potent factor in producing pelvic symptoms. Were this the case our ophthalmological colleagues should long ago have presented large series of cases of dysmenorrhea and other pelvic

*See original article, page 676.

symptoms radically relieved by the mere correction of visual errors. How is it anatomically or physically conceivable that eye-strain can have any bearing whatever upon the production of a mechanical flexion of the uterus?

While looking with skepticism upon the foregoing points, I entirely concur with the speaker in believing that the least possible attention should be given the pelvic organs of young women suffering with functional disturbances. Certainly the symptoms in these cases are not, as a rule, improved by local treatment, and if this course is pursued these patients are likely to have superimposed a persistent and intense neuropathic introspection, which is far worse than the original ailment. The more I have observed patients in general, the more, however, I am convinced that the much talked of reflex symptoms, of which we heard so much a few years ago, are largely hypothetical; indeed when a set of symptoms constantly persists in one area, the organ or organs in that topographical locality should carefully be searched for the seat of the trouble. If it is not found here it is very doubtful whether it will be located in some more remote organ.

While Dr. Morris maintains an ultra-conservatism relative to the pelvic organs, it seems to me that he goes to quite the opposite extreme in his consideration of the vermiform appendix, in attributing so many abdominal symptoms to the involution of this organ. As a query concerning the transplantation of the ovary in order to obviate the disagreeable climacteric disturbances, I would ask why transplant a piece of an ovary when you can leave that same piece *in situ* with its normal blood supply? At the point of transplantation new blood-vessels and lymph supply must be furnished this piece of adventitious tissue, and I believe that much more frequently it will undergo absorption rather than that a true, well vitalized implantation will occur. For several years it has been the endeavor of many conservative gynecologists to leave a whole or even a portion of an ovary after many radical operations. Also it has become the experience of many that this policy does not hold out the possibilities of relief that we hoped it would. This is especially true of the ovaries when they are involved in a general inflammatory attack. No one has been a more ardent advocate of this conservative policy than have I, but I very much regret to say that in many of these cases we have been sadly disappointed, for the symptoms of which the patient complained before her operation many times continue as the result of leaving behind this tissue. The question, therefore, naturally arises whether the mere transplantation of a portion of this same ovary into some other part of the body, where vascularization is much less perfect, would give better results. It can only be settled by the careful observation of these patients subsequent to the operation, and the comparison of their symptoms with those of patients upon whom the radical operation has been performed. My own experience relative to the transplantation of the ovary from one

individual to another is limited to one case. The operation was performed upon a young woman of about 25 years of age, who had been the subject of a double ovariectomy seven or eight years before. She had always been of a neurotic type, and the indications for the operation had been excessive dysmenorrhea. When she came under my observation her nervous symptoms were the dominating ones. Although the transplantation was successful, so far as the mere healing of her wounds were concerned, her mental condition was not in the slightest improved nor were the dormant functions of the uterus stimulated into menstrual activity.

DR. E. E. MONTGOMERY.—Dr. Morris strikes a chord which vibrates in the experience of every person who has practised gynecology for a length of time, and especially those who have gone into the practice of this specialty when there was a greater tendency to the operative craze than there is to-day. Those of us who began earlier in this specialty remember cases sent to us by physicians saying that the patient was suffering from ovarian disease, and the patient would come prepared to have the ovaries removed. Examination generally disclosed that the condition was entirely independent of local disorder and due to a neurotic condition.

It is exceedingly gratifying that we can have such a chart as that prepared by Dr. Morris showing two points, one on either side of the umbilicus which will definitely determine the parts of the anatomical structure at fault. Personally, I would rather be guided by the physical condition of the ovaries, tubes or uterus as revealed by bimanual palpation than to depend upon a tender spot found on either side of the umbilicus. I agree with the doctor that there are many cases treated for flexion and dysmenorrhea when the uterus is not at fault. I know of no organ in the body which is held up for a greater number of sins than is the uterus, or which is held up more frequently for that for which it is not at fault. Many cases suffering from dysmenorrhea are subjected to dilatation of the uterus, curettement, splitting of the cervix, and yet the patient will suffer as much as before. In many cases it will be found that the patient has a patulous uterine canal, that she suffers from a disordered state of the muscular structure of the uterus, which is manifested as soon as the organ becomes congested at the menstrual period. When we consider the increased vascular tension, with the aches and pains that we know are generally associated therewith, we can understand that if a patient has any nervous disturbance it is more likely to be manifested during menstruation. We see such patients suffering from migraine, epilepsy, and other neurotic manifestations.

I fully agree with Dr. Morris relative to the influence of auto-intoxication. I do not question that there are many cases of dysmenorrhea due to the formation and absorption of toxins from the intestinal tract which become localized in the uterus just as

in other parts of the body. These cases will frequently be more benefited by ignoring the fact of the uterine condition and directing attention to the correction of the general condition. I fully agree with Dr. Morris that the influence of eyestrain upon the nervous system will produce manifestations pointing to fault in the uterus.

Dr. Clark referred to the fact that if eyestrain were a factor we would find many cases reported by the eye men as cured. This claim has been made by men who treat the eye. A few years ago dysmenorrhea was attributed to "painful spots" in the nose, and it was said that many cases were relieved after treatment directed to this region. It was claimed that the dysmenorrhea was not due to a pelvic condition, but that in the correction of the condition of the nose the patient received more air and was better able to carry on the process of nutrition. The condition was considered to be a local expression of a general condition. We shall hope that the chart which Dr. Morris has laid down for us will prove to be more effective and more certain than the spots referred to. If by pressing upon these two points we can localize disease we will have made great progress in the diagnosis of many obscure conditions.

DR. THOMAS R. NEILSON.—The peripheral sources of irritation are no doubt often overlooked. It is a very happy feature of Dr. Morris's address that he has emphasized this extremely important point. Eyestrain and various other manifestations, it must be remembered, are not confined to the well-to-do classes; but, those whose vitality is impaired by hard work or insufficient nutrition may suffer just as much from a peripheral irritation as from neurasthenia as their more fortunate sisters.

In reference to the influence of the normal involution of the appendix, I say little from my own experience. Apart from acute conditions, my experience has been confined to chronic disease of the appendix. Often there is associated with disease of the uterine appendages disease of the appendix, and often the question in my mind is which is the more at fault. Sometimes removal of a markedly diseased appendix has ended all symptoms.

The subject of enteroptosis, and especially of loose kidney affords a very fertile field for discussion. The exact importance, however, to be attached to this is still largely in the balance. That a greater or less number of women have movable kidney is not disputed, but that all of these should be subjected to operation is questionable. The symptoms may be purely pelvic, and the discovery of the movable kidney an accident. Whether or not fixation of that kidney is always successful is a question. If the loose kidney is the chief fault, it should, of course, be remedied.

The prevention of adhesions is a very important factor in gynecological surgery. With the aristol film I have had no experience.

In the matter of the transplantation of the ovaries, I have also

had no experience. Like other speakers, it has been my invariable practice to save the ovary whenever possible. When the ovaries are removed, but a portion unavoidably left, general neurasthenic symptoms may not develop. I recall two cases of hysterectomy, one in which one ovary was left, and in this no symptoms developed. In the other case, in which neither ovary could be left behind, the patient was in a few months a complete neurasthenic. Such cases as these alone have impressed me with the desirability of saving ovarian tissue whenever possible.

DR. CHARLES P. NOBLE.—I was much interested in Dr. Morris's paper, particularly with reference to the differentiation of pelvic lesions from lesions in the appendix and in the upper abdomen by the tenderness of the abdominal plexuses. The subject is a novel one to me. I am glad to hear of it and shall look into it. Like Dr. Montgomery I feel that if this proves true in practice it will enlarge our diagnostic ability.

In regard to the relation of eyestrain to pelvic symptoms, I am in accord with the spirit which I believe underlies Dr. Morris's remarks, namely: That many patients suffer from pelvic symptoms who have no pelvic disease. I think that young women frequently have pelvic symptoms without local disease. In my judgment, these local symptoms are as a rule due rather to the fact that the patients are neurotic or that the general health is below par than to their having eyestrain or local trouble in remote parts of the body. The neurologists have been prodding the gynecologists in the opposite direction, saying that the gynecologists were attributing all sorts of symptoms to reflex action from pelvic disease. It is novel and refreshing to have the allegations reversed and to say that pelvic symptoms are reflexes of eyestrain or other lesions in remote locations.

So far as the general remarks with reference to the appendix, disease of the gall-bladder and loose kidneys are concerned, with reference to pelvic symptoms, I think all are in accord with the view that if the patient has disease of the pelvic organs there is no reason why all other organs of the body should not be interrogated; and that if there is disease in other organs of the body it should receive its appropriate treatment. I agree with Dr. Morris that many women have disease in the gall-bladder region and also have loose kidneys, and they should receive proper attention; but it seems to me that the matter is entirely apart from whatever disease they may have in the pelvis. These conditions are complications of the pelvic disease, and are by no means the cause of the pelvic disease.

The question of the transplantation of ovary from one individual to another has been ruled out by Dr. Morris, and the discussion is therefore upon the question of whether or not we shall resect the ovary and then transplant it under the peritoneum or leave it or a part of it, in its normal position and remove the tube

if that is necessary. It seems to me that it is far better to leave it with its normal blood supply rather than to transplant it under the peritoneum.

My own feelings about the artificial climacteric is that the matter has been very greatly exaggerated in the literature in the past few years under the influence of the great wave which arose in opposition to the very radical procedures of twenty years ago. There is no doubt that in certain cases there is a great deal of trouble from the artificial climacteric, but my experience indicates that the percentage of these cases is small. In my experience those cases which have been troublesome have been particularly in young women and in neurotics or in the class of patients known as "cranks." In women past thirty, certainly past thirty-five, the artificial menopause has been very similar in its manifestations to the normal menopause.

DR. BARTON COOKE HIRST.—It seemed to me while listening to Dr. Morris that we were indebted to him for correcting the tendency of all specialists to concentrate their minds too much upon the organs which they treat, but I could not help thinking that Dr. Morris went as far in his direction as we sometimes go in ours. I think there is no more reason for paying greater attention to eyestrain than to the pelvic condition if there is anything abnormal in the latter.

In reference to the transplantation of ovaries, I remember on one occasion feeling grateful to Dr. Morris for his work on this subject. In a case in which I removed the entire ovary on account of disease of the hilum I was glad to have read Dr. Morris's work because it suggested to me the reimplantation of the cortical portion, the other ovary having been previously removed. The subsequent history for two years was satisfactory.

DR. J. M. BALDY.—A general view of the whole field is of an enormous amount of interest and importance. Running to the other extreme seems to be the trend of the general surgeon in viewing gynecological subjects. The general surgeons have a profound knowledge of general surgery, but no practical knowledge of gynecology, and often fall into absurd mistakes with the views which they entertain on gynecological subjects. The one who does not take a general view point is not competent to pass on any general gynecological subject. The general surgeon who looks for peripheral lesions in other portions of the body, as the gynecologist of yesterday looked only for that lesion in the pelvis, is as far astray as the gynecologist, and he will never make progress beyond the progress of the gynecologist of the past until he realizes that the general central nervous system dominates the whole body. There is no doubt, as Drs. Noble and Montgomery brought out, that peripheral lesions due to eyestrain, loose kidney, normal involution of the appendix are due largely to a central impulse. The cause of the disorder is a vicious nervous system and this vicious nervous system will cry out in any portion of the

body as a "cough," as it was called by the essayist. If, however, the gynecologist considers a "cough" in the pelvis the whole thing; or the eye man considers an eyestrain the whole thing, or the surgeon a normal involution of the appendix the main consideration, they are all equally astray and they must go back to our neurological friends, who have been largely right in their estimate of the matter from the beginning. This is recognized to-day by the gynecologists; I cannot answer so much for the general surgeons after the remarks of to-night. I have never seen a neurasthenic every fraction of a millimeter of whose spinal column beyond the lumbar plexus was not tender. The theory of the pinching of nerve filaments in scar tissue is given us by the older surgeons as an explanation of a large number of nervous diseases. This idea in connection with the normal involution of the appendix, I believe, is an absolute absurdity. In regard to the pain in an ovarian stump, we have all seen stumps which have cried out more than the original ovary on account of the nervous system, and as we have been fools enough to believe that removal of the ovary would relieve the symptoms, so we thought removal of the stump would cure the pain supposed to be caused by pinching the terminal nerves. We gynecologists unlearned that years ago. I am sorry to see the general surgeon still in the fog. Ang yet the general surgeon is writing of "the passing of the gynecologist!"

The question of adhesions has always been a troublesome one to the clinician and general surgeon. To the gynecologist it is a very simple thing. Most of the pain from adhesions is really from the nervous system. And you do not often find adhesions when there has been done clean work. Adhesions exist twenty times where they give pain once,—another thing for the general surgeon to learn.

There is no question of the truth of Dr. Morris's statement concerning the transplantation of ovaries from one woman to another; they will not develop. It is equally true that following the transplantation of her own tissue there will not be development. This axiom he does not seem to have grasped.

Dudley had to admit that almost invariably absorption of the ovarian tissue would result. The menstruation which is said to have followed these cases is in reality only a spurious little bleeding and a man who can stretch his imagination so far as to call it normal menstruation wants very badly to find menstruation. Even that in time disappears.

I am not convinced that such a thing occurs as ovarian secretion any more than is true of any other ductless glands. This statement is repeatedly reiterated, but remains far from proven.

That where you remove both ovaries you get certain nerve symptoms is true; but those symptoms are absolutely definite routine, and their cause and significance well understood. The symptoms are purely those of the menopause and only those of

the menopause. That is a definite physiological result, and if we remove all ovarian tissue we get it. In many cases the removal of one ovary will cause the patient to pass through the menopause just as if both had been removed. There are two sides to the saving of ovarian tissue at operations. The general surgeon gives you one side. The other side of the question is this: We save it, because it is ovarian tissue. There is, however, no proof that it is healthy. The balance of the ovary is grossly diseased. Will you say in cancer that one-fourth of the breast is diseased and the balance healthy? None of the general surgeons will operate on that principle. If you have connective tissue changes you have it all through the ovary. Who can say that one portion is healthy and one portion not healthy, simply because to the eye it looks passable? You leave part of an ovary and threaten the future life or comfort of the patient. No one knows the cause of ovarian cyst, and if you have an ovary which is diseased, how can you tell that it will not develop ovarian cyst, and what right have you to put a patient into such a position? Still worse, she may fall into the hands of some one who cannot give her the skilled help you can—one of the general surgeons, perhaps. I am altogether out of sympathy with it. I have always been out of sympathy with it, and am delighted that my friends, Drs. Clark and Noble, take much the same ground to-night which I have been holding and have been teaching for years past.

DR. JOHN B. DEEVER.—I congratulate my friend, Dr. Morris, and I am strongly in sympathy with him. I believe, with Dr. Morris, that certain of these cases of involutinal appendices are capable of occasioning pain by peripheral nerve impingement and thus constitute a source of great discomfort; the removal of such an appendix is followed by complete relief.

Dr. Morris's paper should stimulate all to study these cases most carefully. Many a slip is made and an improper operation done by not having carefully studied our cases.

I have long since come to the conclusion that the operation of stitching up the kidney is one of the most useless operations in surgery. I have furthermore long since concluded that Edebohl's remarks upon pain in the right iliac fossa in connection with movable kidney being indicative of chronic appendicitis are verified in but few instances. We have only to look at the anatomy, study the living pathology of the loose kidney with the belly open to know that the loose kidney is capable of irritating the ascending colon.

On the question of prevention of adhesions I cannot agree with Dr. Baldy. I have reoperated one patient as much as four times for adhesions with ultimately permanent cure. I had the pleasure of seeing the first case that Dr. Morris operated on. I think he had done three or four operations when he resorted to the Cargile film. I have not used the aristol film, but when I have employed the Cargile film I have had fewer reopera-

tions than when I have not used it. As Dr. Baldy said, if we could eliminate infection we would doubtless have fewer cases of adhesions; yet I see adhesions that follow aseptic operations.

The whole subject is most interesting, and particularly the relation which the gynecologist now bears to the general surgeon—no longer the relation which the general surgeon bore to the gynecologist. I hope I may hurt no one's feeling in telling a little story which I may have told here before. I happened to be in a court case some time since, when one of our old and very distinguished specialists was on the stand. Later on Dr. So-and-So took the stand, and the lawyer said to him, "You are a doctor?" he answered, "Yes, sir." "Is there any difference between a specialist and a doctor?" The answer was, "It takes seventeen of those fellows to make a doctor."

DR. MORRIS closes.—Dr. Clark says that correcting the eyestrain is not enough to stop the "cough" in the pelvis. Well, that is often true; if the ophthalmologist stops with the head, and the gynecologist stops with the pelvis, it leaves the patient wide open in the middle. Dr. Thomson says that every living body is a laboratory in which are produced a greater number and a greater variety of poisons than are found on any apothecary's shelves. After the ophthalmologist has done his part we must see that all of these "seventeen men who go to make up a doctor" work on the question of disturbed metabolism. We must find that which is wrong in the patient's habits of life, and there is really needed a good doctor to take charge of the case after the specialists are through with it. Given a case, however, in which eyestrain furnished the original peripheral irritation that resulted in this "cough" in the pelvis in the form of a flexion; given a case in which various specialists have found out just where they can be of service, then let a good doctor take charge of the patient and it is wonderful what fine rosy young women we will get out of a class of patients formerly subjected to local treatment with disappointing results. Neurotic patients or those with a minor psychosis will still disappoint us.

Dr. Clark says that transplantation of the ovary, even homotransplantation, is likely to result in degeneration, and that it is better to leave a part of the original ovary rather than to remove it. That is very true, and I would leave a part of the ovary with its original attachments where I can, but in cases where that cannot be done I would transplant a part of that woman's own ovary, provided it appears to be in practically good condition. I will say that I have had some troublesome degenerations in cases in which this has been done, and I have at present two or three patients with cystic degeneration of the transplanted ovary done two, three or four years ago, not large cysts, but one as large as a turkey egg. On the other hand, I have a number of patients who are going on more comfortably than they did for years, and probably more comfortably than if I had removed both of the ovaries completely and not transplanted.

Dr. Montgomery prefers to depend upon palpation of the adnexa and of the uterus rather than upon distant peripheral irritations. That is what we are to do in cases in which there is tangible cause for the local irritation, but I wished to leave out of the discussion to-night such probable and tangible objective signs as we could get by bimanual palpation.

Dr. Noble tells us that most of these patients are neurasthenics anyway. Dr. Noble also says that we exaggerate the importance of the artificial menopause. That may be true. There are some cases, particularly of women past 35, in which it is undoubtedly desirable to bring about a complete climacteric rather quickly; but in younger patients it seems to me that the distress coming from the precipitate menopause is likely to be extreme, and that is the distress which has been relieved by such ovarian transplantation as I have done.

Dr. Hirst says that eye trouble and pelvic trouble can occur together and that each needs separate treatment. That is also particularly true. Almost all the things that have been said to-night by all of us are true. It is a matter of nice critical analysis of all the points. When eye trouble and pelvic trouble occur together it is very difficult to know which is cart and which is horse.

Dr. Neilson calls attention to the fact that not all loose kidneys are suitable for operation, which is a fact. We have loose kidneys which do not produce symptoms, and others that do. Some cause only a small part of the history, and if we correct that feature alone we shall do discredit to surgery. Other loose kidneys furnish the chief cause for invalidism which is curable by operation.

Dr. Baldy says that absorption of the ovary is likely to occur, and says that we are likely to run to extremes on this question, and that the pendulum will swing the other way. I do not believe in the pendulum simile. I doubt if we ought to be pendulums on any of these questions; rather rifles, and get just as near to the bull's eye as possible. As Dr. Baldy says, the central nervous system is the important thing to keep in mind continually. It is true that when we find the lumbar plexus irritated from the pelvis in a neurasthenic patient we will find the splanchnic area sensitive; but, when we find this pair of points tender we have our clue to the origin of the irritation. Every one can find these points of great value by working out this theory. Dr. Baldy says we do not have contraction of the connective tissue in the involution appendix and irritation of the nerve filaments. I differ with him on that point. These cases are among the most satisfactory ones that we have to treat. While we may tell the patients that they do not absolutely need to have the appendix removed, they often return at the end of some weeks and request that the appendix be taken out. In many cases in former years in which the surgeons have operated for chronic appendicitis they have felt dis-

turbed at finding what looked to them to be a normal appendix, but its removal has secured for the patients immediate and great improvement in health. I do not believe there are many men in this room who have not had this experience.

Dr. Deaver calls attention to the fact that we do not commonly have infection of the congested appendix with loose kidney. That has been the ground I have taken, but we often do have congestion of the appendix associated with it and tenderness of the cecum and ascending colon. I have not removed congested appendices found in connection with loose kidney, but some of my colleagues make it a rule to do so.

TRANSACTIONS OF THE WOMAN'S HOSPITAL SOCIETY.

Meeting of January 2, 1906.

DR. BISSELL in the Chair.

DR. PINKHAM.—I would like to have the opinion of the Society on one point in a case of retroflexion. After some difficulty I replaced the uterus and held it in place with the pessary, and, as my custom is, I asked the patient to walk two blocks and come back. She came back and said she did not feel the pessary.

She went home and about twelve hours later began to have such severe pain in both groins that she sent for me. She had removed the pessary as directed as soon as the pain became severe. On examination the next day I found a mass on both sides of the uterus, a double pyosalpinx and one ovary badly cystic. I removed one tube and ovary and did a conservative operation on the other ovary. The tube which I left appeared healthy except for a slight thickening, and it was patulous. The question in my mind is whether the tube will remain patulous, and whether she will be able to functionate.

DR. JANVRIN.—How long ago did this operation take place?

DR. PINKHAM.—About November 2.

DR. JANVRIN.—Has the woman menstruated since then?

DR. PINKHAM.—She has done so.

DR. JANVRIN.—It strikes me that the prospects of the case are very good for conception since menstruation has taken place so quickly.

DR. WEST.—It is utterly impossible to make an intelligent prognosis where there has been a salpingitis, because different women act in such a different way in regard to the healing property in these cases. I had a case recently where the woman complained of no symptom except sterility. I operated for sterility and upon opening the abdomen found both tubes closed. The woman had been married eight or nine years and was only 32 years old. The

tubes were resected, as there was no pus, and the peritoneum of the tube was stitched to the mucous membrane. I have seen that woman this morning and she is undoubtedly pregnant. I operated on another case in a similar way. A year later I had to operate upon her for intestinal obstruction. This appeared to be a much more favorable case than the former. I resected these tubes in the same careful way, but their ends were found to be completely closed by adhesions when the operation for intestinal obstruction was done.

A small proportion of these cases bear children. I have never seen reported by well-known men who have done conservative work an instance of pregnancy occurring after conservative operation on the tubes for double pyosalpinx.

DR BISSELL.—Do you make a distinction between a tube diseased from gonorrhea?

DR. WEST.—I make a distinction only where the epithelium of the tube does not become converted into a pyogenic membrane, as it does in a pyosalpinx where the tissue is destroyed. Where there is a low grade of inflammation, where pus is not present, there is a possibility of conception. In the other case it is the tube more than anything else that prevents conception.

DR. CONAWAY.—This recalls a case I operated on for sterility about a year ago. I removed one tube and ovary and about two-thirds of the other ovary. It was a case of pyosalpinx on one side, and the condition on the other side was apparently the result of a very low grade inflammation. The patient became pregnant about four months after the operation.

DR. TAYLOR.—What was the probable cause of the pyosalpinx?

DR. CONAWAY.—Gonorrhea. She had been under my care for gonorrheal vaginitis about eight months previous. She was never pregnant until after the operation.

DR. PINKHAM.—There is a difference between what we ordinarily call pyosalpinx and pus in the tubes. I call this case a true pyosalpinx. As Dr. Emmet remarked, the epithelium is destroyed and replaced by connective tissue. This case was undoubtedly of gonorrheal origin.

DR. BACHE MCE. EMMET then read a paper entitled

MACROSCOPICAL APPEARANCES OF THE OVARY WARRANTING ITS
REMOVAL.*

DR. MCGINNIS.—I have been asked to discuss the question, "Is There a Pathologic Basis for So-Called Ovarian Neuralgia?" I consulted Hirst's System, Pozzi, Thomas, Emmet, and several others, all of whom were of the opinion that there was no such thing as "ovarian neuralgia." We all come in contact with cases of ovarian pain which is exceedingly obstinate. The question is whether this is a disease or a symptom. The authorities mentioned unite in saying that it is a symptom of ovaritis, acute or chronic. With any involvement of the ovary, pain is always present. This may also be caused by conditions that produce prolonged congestion of the ovary, such as prevention of pregnancy.

* See original article, page 651.

sexual excesses, menstrual congestion, subinvolution, malpositions of the uterus, habitual constipation, pelvic and abdominal tumors, disorders of digestion, and incompetency of the vascular system. There is one other condition, called by foreign observers "mittelschmerz," which appears between periods, and which is probably due to the other causes of which I have just spoken. It is generally of reflex origin or it may proceed from diseased or undeveloped ovaries.

DR. PINKHAM.—As regards whether we should remove the cysts of a cystic ovary instead of the whole ovary, as Dr. Emmet advises, I should say that this should be done when we are dealing with only one remaining ovary, and if the subject is a young woman. I think we are justified in removing the cysts which appear on the surface, if we explain to the patient beforehand that there is a liability of a second operation. I have had the same experience as everybody has, of having to reopen the abdomen.

DR. WEST.—I have seen several cases where a cyst had been removed on one side and the ovary left on the other, also where part of a diseased ovary had been removed which eventually required a second operation. I have had the misfortune several times to see the development of a tumor in a remnant of ovary necessitate the performance of another laparotomy. Personally, I take the position that if it is necessary to remove one ovary on account of the presence of a cyst which occupies the whole ovary, and a true tumor is found in the other ovary also, the whole organ should, in most cases, be unhesitatingly removed. The probability is that a neoplasm would develop and require a second operation. The cases in which we have to be very careful are, of course, married women in the child-bearing period of life. If the patient is near the menopause we should certainly remove both ovaries.

DR. BROWN.—I feel that it is greatly to be regretted when we are forced to remove both ovaries in a patient during her sexual life. I think unquestionably if we can leave the smallest portion of at least one ovary a nervous balance is maintained which the patient loses if we remove both. On the other hand, I am fully convinced of the dangers in chronic ovarian diseases of removing a portion of a diseased ovary, on account of the possible necessity of another operation subsequently. My belief is that in chronic or cystic ovaritis it is almost useless to simply puncture the cystic follicles and leave what, to outward appearances, we consider is a healthy ovary. Such practice I regard as inviting a subsequent operation. I feel that it is very much safer for the patient to bisect such an ovary and after examination either to remove it entirely or leave such a portion as appears to be normal, hoping that it will not require a subsequent operation. I would hesitate greatly, if the ovaries were the seat of true cysts, to leave a part of either one.

DR. GRAD.—The difficulty in considering chronic ovaritis is not only in knowing which organs to remove, which to resect and

which to leave, but in diagnosing such cases before they come to operation, when they present various symptoms yet a pelvic examination shows little evidence of their great disturbance. The question to be decided is whether these patients are suffering from a disturbance of nerve balance due to enlargement of the ovaries or to some condition with which we are not familiar, and whether removal of the organ will give relief. Before removing the ovaries we must consider menstruation, ovulation and internal secretion.

DR. MCGINNIS discussed the electrical treatment of ovarian affections.

DR. JANVRIN, after discussing the palliative treatment of ovarian disease, said: In removing the ovary I always try to save a portion of the tissue. If there is any portion of either ovary which is not to my mind infected to such a degree as to preclude its being safely left behind I always leave it. I cannot recall more than one or two cases where I have had to open the abdomen a second time for a disease of that portion of the tissue which has been left.

DR. EMMET.—So far as I have been able to keep track of the women upon whom I have been compelled to make total ablation, I have failed to observe any of the marked features which are constantly ascribed to such an operation, and with the exception of moderate nervous waves with perspiration, absolutely nothing has occurred to mar the happiness of the women unless it be the persistent regret they could not bear children. Therefore, my main purpose is to make this possible.

TRANSACTIONS OF THE WASHINGTON OBSTETRICAL AND GYNECOLOGICAL SOCIETY.

Meeting of January 5, 1906.

The President, G. N. ACKER, M.D., in the Chair.

DR. J. T. JOHNSON presented the specimen and history of a

TUBOOVARIAN ABSCESS.

Mrs. W. W., aged forty-three, entered George Washington Hospital December 10, with the following history. She had been well up to six years ago, when she had fever after her fourth confinement. Her chief symptoms for the last three years had been uterine hemorrhages occurring regularly every two weeks, and the anemia consequent on the loss of so much blood. While she had suffered no ovarian pains, all abdominal pressure caused her to wince slightly. She was sent into my service at the hospital for an operation for the removal of a cancerous uterus. I doubted the diagnosis on account of her healthy appearance and

the length of time she had been bleeding. I secured some scrapings from the uterus for the pathologist. But he reported, as they usually do, that he was unable or unwilling from what he had found, to say the case was malignant.

We waited about two weeks for this valuable opinion. The patient in the meantime declaring if we did not do something for her at once she would leave the hospital and seek some more active and effective treatment.

I arranged to make an exploratory abdominal incision and be governed by what we found. A vaginal operation would have been very difficult, as we had absolutely no cervix, its place being marked only by a depression or dimple.

The presumption is that it was so injured in her last labor that it sloughed completely away. Her serious and prolonged illness at that time adds force to this suggestion. At her operation the uterus from the abdominal side appeared healthy, only being slightly enlarged and feeling normal to manual compression.

The ovaries and tubes were, however, badly diseased.

They were enucleated from beds of adhesions and removed and are now presented as pathological specimens. They seem quite sufficient to account for the uterine hemorrhages.

DR. I. S. STONE said he had seen cases of malignant disease without cachexia. One was a case of intestinal obstruction. The woman was healthy looking and there was no thought of cancer, but upon operating there was found widespread carcinoma. In another case, 60 years old, with uterine hemorrhage, tumor, and distention, there proved to be cancer of the uterus, stomach, and mesentery. Diseased adnexa frequently cause uterine hemorrhage. In many cases there is an arteriosclerosis in the uterus itself.

DR. TREMONT SMITH.—A lady of 65 years had marked ascites of five months' standing. There were no other physical signs. The heart and kidneys were normal, the color good, and there was no cachexia. Dr. Robert Abbe, who saw the case, advised the withdrawal of the fluid, and after this was done masses were felt throughout the peritoneal cavity, which were evidently carcinomatous. The case is mentioned to show the absence of cachexia in some cases of malignant disease.

DR. JOHNSTON said the absence of cachexia, the inability of the pathologist who examined the scrapings to make a diagnosis, the bimonthly flow without intermediate discharge, and the fact that the hemorrhage had continued for three years, made him doubt the diagnosis of cancer.

DR. TRUMAN ABBE read the essay of the evening on

RADIUM THERAPY.*

DR. STONE asked Dr. Abbe if radium had any selective action. If it simply destroys tissue and has no selective action for car-

* See original article, page 680.

cinoma cells he cannot see any advantage over zinc chloride. He has little hope that radium will prove to be of real therapeutic value in cancer cases.

DR. BOVÉE does not believe that anything is to be gained by the use of radium.

DR. MILLER said that if the statement of the essayist were correct, that radium and x -ray would prevent conception in women, they will doubtless become an agent productive of much evil in the hands of those who wish to indulge their sexual appetite and not become pregnant. As soon as the idea gets to be generally known it will certainly be taken up by quacks and physicians without acute consciences as a service of revenue.

DR. JOHNSON stated that he agreed with Dr. Miller that it would be productive of much immorality when the idea became generally known, and also with Dr. Bovée that the use of radium as a therapeutic agent in gynecology is of little or no value.

DR. LEWIS commended Dr. Abbe in his endeavor to introduce a remedy which offers a hope to those suffering with an incurable disease. He believes, however, that surgery offers the best hope of cure in cancer.

DR. KELLEY said that the prognosis in cancer of the cervix is so bad that a remedy which does no other good, but instills hope into the patient, has a field of usefulness.

DR. ABBE, in conclusion, said that the treatment of Dr. Morton consisted in the use of what he called radioactive water (salt solution exposed to radium), fluorescent substances such as quinine and exposure to radium. He has tried this mode of treatment without benefit except relief of pain. Radium relieves the pain of neuralgia in ten minutes. As to the selective action of radium there is none, except that the more rapidly growing the tissue the greater the effect of the radium. It has been conclusively proven in guinea pigs that radium produces sterility in the female by preventing the ripening of the Graafian follicle. It produces sterility in the male also. He is convinced of its efficacy in rectal cancerous strictures in relieving pain and rendering the operation of colostomy unnecessary.

Meeting of January 19, 1906.

DR. KELLEY presented a case of
FIBROID TUMOR OF THE UTERUS.

The President, G. N. ACKER, M.D., in the Chair.

Mrs. S. W., aged 52, married, no children. Menstruated first at 14 years, always irregular, began to be profuse about fifteen years ago, and for the past three years has been bleeding prac-

tically all the time. She began to have pain in the abdomen nine years ago, and soon after observed that the abdomen was much larger. The diagnosis of a fibroid tumor was made, but the physicians advised her to let it alone.

She came to my office last summer. Examination showed a hard tumor reaching to the umbilicus, through the vagina. It was found to bulge well down and was more tender than over the abdomen. She entered the Sibley Hospital two weeks ago and was operated on three days ago.

The intestines were adherent over the lower nodule, which has undergone necrosis. The uterus was amputated at the internal os and the tubes and ovaries were removed with it, the woman being past the usual age for the menopause. The vermiform appendix was adherent to the necrosed part and was also removed.

The specimen weighs three and one-half pounds, is an irregular rounded mass showing numerous interstitial tumors and several small ones attached by pedicles. The most interesting of these latter is a long sausage-shaped tumor attached by a small pedicle, which had undergone a necrosis and was adherent to the cul-de-sac.

This patient gave a most perfect history of a fibroid tumor and showed the loss of blood to an exaggerated degree. She was bedridden and it was only that she was tired of such a life that she permitted herself to be operated on.

She was fed up and given strychnia and iron for ten days. She stood the operation well and her pulse has not been above a hundred since.

DR. J. T. JOHNSON.—The idea prevails that the menopause will cause an atrophy of these tumors, and if the patient can be tided over to that period all will probably be well. The menopause is really the time when the degenerations begin to make their appearance. These tumors are so successfully removed now that the prognosis is better with an operation than without.

DR. CARR thought the necrotic white part of the tumor was probably a tag of fat from the bowels. The ovaries in this specimen were not healthy, and he has never seen healthy ovaries with fibroids of the uterus. Every one would recommend operating unless there were some marked contraindications. The majority of cases demand removal. He recalled a case in a young woman where the tumor was found while operating for a hernia. The family refused to have the tumor removed, and he was compelled to operate later on account of symptoms to which it gave rise. Another woman refused to have an operation performed until kidney symptoms and symptoms of intestinal obstruction arose which made the outlook much more serious. Sooner or later all these cases require operation.

DR. STONE.—Much has recently been said about the influence of these tumors upon the heart. In a number of his cases there

have been heart lesions. The kidneys are also frequently diseased. He had never seen a case where a myoma had degenerated into a malignant growth. The mortality of hysterectomies for fibroid is from 7 to 10 per cent. He had lost several cases from pulmonary embolism.

DR. JOHNSON said that he removed a tumor supposed to be a fibroid which had existed for twenty years and which was pronounced by the pathologist to be a sarcoma. This case would point to a sarcomatous degeneration of a fibroid.

DR. KELLEY said that heart disease and fibroid tumors are frequently found in the same woman. In women of the age of his patient the ovaries are generally cirrhotic. According to Cullen, fibroid tumors may undergo sarcomatous degeneration. He believes also that the cervix will be more often removed in all hysterectomies in the future than in the present. In gonorrheal infection this is at times necessary in order to cure the disease.

DR. WHITE presented a specimen of

ABDOMINAL ANEURYSM.

R. B., aged 33 years, farmer by occupation and a native of Virginia. His father died of paralysis. No family history of gout, syphilis, rheumatism, tuberculosis, or malignant disease. He was a healthy child and had, before puberty, measles, mumps, whooping-cough and chicken-pox. In each instance his recovery was uninterrupted. Since manhood he has had joint and muscular pains which he attributed to rheumatism, but which developed subsequent to contracting syphilis and gonorrhea, six years ago. The venereal diseases were therapeutically disregarded. The urethral discharge continued nine months. During the past summer he complained of moderately severe pains in the lumbar regions, persisting from two to twenty-four hours. Three weeks before admission he complained of almost constant pains in the right thigh, especially on the anterior surface, radiating to the knee. Aside from this indisposition, he has been well, attending the usual duties of an agriculturist. He has had no gastrointestinal symptoms, has been free from pain except in the regions mentioned, slept and ate well. Although he has not been a strong, active man, he has supported a wife and several children by manual labor and was confined to bed only three days before his admission to the hospital.

Early on the morning of December 28, immediately after taking food, he had sudden, violent pain in the right lumbar region, which persisted with unusual intensity for an hour. He was compelled to take to his bed at once. The pain moderated, but was constant. About two hours after the onset a swelling appeared in the right lumbar and iliac regions, slowly increased in size until it was clearly discernible by the patient twenty-four hours later. During the first day he vomited once or twice, and

on the second day emesis again occurred. His bowels moved once in two days. He was completely exhausted on the 29th and remained quiet. On the 30th his physician (Dr. H. P. P. Thompson) decided that he needed hospital treatment and felt obliged to move him although his condition was critical. He transferred him with the greatest caution, and it was while changing cars in Washington that his physician decided that the condition of the patient would not warrant the trip he had contemplated.

He was brought to the hospital about 2 P. M. Examination showed a mass, flattened, hemispherical, about five inches in diameter; the center about one inch above and external to McBurney's point, dullness on percussion, no fluctuation; skin edematous and veins dilated over the area. The patient had been given, during his journey $\frac{3}{4}$ gr. morphia, hypodermically and there was little pain. The pulse was too weak to count, but near 140; the respirations were 12, sighing in nature (the pupils were not contracted). He was in a cool, drenching sweat, and he had the facies of a critically ill man. Consciousness was retained. An operation was determined upon and begun at once. The patient was entirely too weak for the administration of a general anesthetic, and alypin was used, 1 gr. to 1 ounce of sterile water. There was injected during the entire operation $1\frac{1}{2}$ oz. by the infiltration method, with perfect anesthesia. The incision was made over the center of the mass. Before the peritoneum was incised, the tissues showed blood stains of several days' duration. Aspiration was then tried several times with a hypodermic syringe, but it failed to fill. The peritoneum was then divided and the abdomen was seen to hold a large amount of clotted blood, about six or eight ounces of which was removed. Toward the median line the exploring finger could feel a tense pulsating wall extending above and below further than the finger could reach. The hemorrhage had ceased; salt solution was poured in and the abdomen closed. The patient left the table very much comforted in mind, and without loss of physical strength.

He reacted exceptionally well, was unusually free from pain and without mental exhilaration or other manifestations of poisoning.

On the third day after operation his pulse had improved very much under the use of saline solution and strychnia. He slept well, but complained of pain in the right thigh.

From January 3 to 7 his temperature was irregular, varying between 102.4 and 98.8, while the pulse ranged from 64 to 118. A loud bruit was heard over the epigastrium and was transmitted to the other areas of the abdomen. A distinct thrill could be felt just above the umbilicus. There could be felt a pulsation, but it was not expansile in nature.

On January 5 the pain in the leg ceased, and an area of anesthesia, corresponding to the external cutaneous nerve, developed.

The limb became swollen from the ankle to Poupart's ligament. January 6 and 7 the symptoms remained unchanged, except that edema of the leg was greater. He was fairly comfortable, relished his meals and digested them well.

At 4 A. M., January 1, he had a sharp pain in the abdomen, followed by syncope; he died half an hour later.

Necropsy: A large quantity of fluid and clotted blood was found in the abdominal cavity from an inch below the superior mesenteric artery to half an inch above its bifurcation. The aorta was the seat of a dissecting aneurysm, which measured in the recent state about six inches long and four inches in its greatest diameter. It was roughly globular in shape, the aorta crossing and communicating with its anterior surface. The greater part of the sac was to the right of the middle line and extended below the promontory of the sacrum. The sac was lined in many places by laminated clots. The rupture appeared to occur on the right side. The spine was eroded. The common iliac veins did not unite to form the inferior vena cava at the usual site, but were joined by a small branch at that point. The left common iliac remained as such until it reached the level of the renal artery, then crossed the aorta to join the right common iliac, from which point the two became the inferior vena cava.

DR. BALLOCH said that he had met with only one case of aneurysm of the abdominal aorta while operating. He was assisting in an operation for appendicitis. The diagnosis of aortic aneurysm is frequently difficult to make. He recalled a case of abdominal aneurysm where a number of physicians had made a wrong diagnosis.

DR. CARR said the case presented by Dr. White was very interesting. It had presented all the symptoms of an ovarian cyst with a twisted pedicle except that it occurred in a man. Dr. Thomas, who had seen the case, suggested that it was possibly an aneurysm of the renal artery, and he himself thought it not unlikely, as it was confined to one side. The most remarkable thing about it was the cessation of the hemorrhage after rupture.

DR. THOMAS said when he saw the case there was expansile pulsation in the region of the kidney, and this suggested to him that it was probably of the renal artery.

DR. LOREN JOHNSON read an essay on

ENURESIS IN CHILDREN.

Enuresis during the early months is a normal condition and only when it extends beyond the second year does it become pathological.

To make clear how slight a deviation from the normal may determine the continuance of the early enuresis it may be well to recall for a moment the influences governing urination.

The lumbar centers which directly control the act of urination are inhibited in part by higher centers, so that in life beyond the infantile stage, the individual wills to urinate or not.

The lower center is stimulated by a reflex from the bladder, which at the same time has sent a message to the higher center, whence the control by will of the act of urination.

In infants the inhibitory power in the brain is not developed and any stimulation of the lumbar center is followed by the evacuation of urine. As the inhibitory power develops the child no longer passes its urine involuntarily.

But should enuresis continue, one or all of three conditions prevail. First; Through some lack of development, the inhibitory power does not gain force. Second; The lumbar center is so constantly irritated that less than the ordinary stimulus is necessary to excite it to action. Third; Through an oversensitive general nervous system, stimuli are being constantly sent to the lower center, exciting it to action.

Under the first head, may be included cases of organic lack of development as in idiots. Under the second, all manner of reflexes, as full bladder, phimosis, stone, uric acid or alkaline urine, urine of very high or very low specific gravity.

Under the third head, malnutrition caused by syphilis, tuberculosis, malaria and especially the chronic intoxications of indigestion, may be the exciting cause.

Enuresis may at times be considered a pure neurosis, hereditary in nature in so far as a neurotic tendency is hereditary, though physical causes may be present which may cause incontinence, with a normal nervous system.

The symptoms consist merely in an involuntary passage of urine, more frequently at night, and commonly during the first hour or two of sleep, for it is during this time that the child's sleep is deepest, with the consequent more complete relaxation of all control. The bed may be wet, however, two or three times during the night.

The diagnosis of the condition is always made by the parents, but the recognition of the exciting cause is not always so easy, and on the success or failure of this factor depends the prognosis.

The majority of cases of enuresis, especially in dispensary work, are treated with a shot gun prescription of belladonna to quiet the nervous system, nux vomica to tone up the sphincter, and some alkali to overcome the acidity of the urine, giving no attention to the fact that enuresis is a symptom and not a disease.

In the examination of a patient it is well to have a certain routine and to go through it carefully.

See that the child has enough sleep and of the right kind. Investigate the regularity of the meal hours and the time spent in eating, the appetite and the character and frequency of the stools, the amount of water taken and the time of day when most used. Not enough water produces a highly concentrated urine which acts as an irritant. Too much water, especially before bedtime, overdistends the bladder, and in these cases a dry supper and no liquids after four o'clock works wonders.

The importance of investigating the appetite, food and condition of the bowels lies in the fact that intestinal indigestion is a very potent factor in reducing enuresis.

In those children who receive a warm bath once a week, great benefit may result from sponging off every morning with cold water, especially along the spine, while the child stands in warm water.

The external genitalia should be examined and any abnormalities treated, and that does not mean that every boy baby should be circumcised. The prepuce plays an important part in affording protection to the glans penis, and this covering should not be sacrificed when the breaking up of adhesions or stretching will answer the same purpose.

It is well to make a thorough examination of the child, including its nose and throat, as catarrhal conditions of the nose and throat, adenoids and enlarged tonsils may be present. Hernias, undescended testicle and other conditions may reflexly cause enuresis.

One mistake in the treatment should be carefully avoided, and that is punishing the child for its bedwetting, as this can only make it worse; rewards should rather be offered for a dry bed.

Frequently when enuresis is merely a habit, the passage of a sound or the washing out of the bladder will stop it.

DR. ADAMS said that we see cases of enuresis in children which have run the entire gamut of the various drugs and operative treatment and remain uncured. There is much in habit in these cases. There is usually more difficulty in curing boys than girls. There is nothing in direct inheritance, but the child of neurotic parents is apt to be neurotic, and, consequently, more apt to be affected with the ailment. The degrees and results of the disease vary greatly. He has now a case under observation with a contracted bladder and hydronephrosis. Preputial adhesions act in

a considerable number of cases by causing irritation. Circumcision or breaking up of the adhesions will at times cure the trouble. In one of his cases the father had invented a device to prevent the child from lying on its back, hoping to cure the trouble in this way. The routine examination of the urine is advisable, but the condition of the urine is seldom responsible for the ailment. He generally gives increasing doses of belladonna, beginning with a few drops of the tincture and pushing the drug to the point of tolerance. Adenoids cause so many nervous symptoms that they may be a factor in causing enuresis.

DR. MORGAN.—There are some things which are an opprobrium to medicine, and this disease is an example. The limitation of liquids is beneficial, as is the cutting out of meat and sugars from the child's diet. Belladonna is an efficacious drug. Recently a boy in the Garfield Hospital was apparently cured by dilatation of the bladder.

DR. ACKER said that often a change of environment and diet produced good results. He is afraid of belladonna; thinks raising the foot of the bed acts beneficially. Indications are likewise to improve the condition of the nervous system by strychnine, tonics, etc.

DR. LOREN JOHNSON, in closing the discussion, said that the tendency was for the bladder to become contracted. The thing to do is to find and remove the cause. His experience is that lessening the quantity of water acts beneficially. Psychological influences are important.

Meeting of February 2, 1906.

The President, G. N. ACKER, M.D., in the Chair.

DR. I. S. STONE reported a case of

PREGNANCY FOLLOWING A CONSERVATIVE OPERATION FOR ACUTE
GONORRHEAL SALPINGITIS.

Miss ———, aged 20, was admitted to Sibley Hospital in September, 1896, with acute pain in the abdomen, pulse 120 and temperature 102. She had all the symptoms of peritonitis from either appendicitis or salpingitis. Her appearance indicated serious illness. Her physicians had the straightforward admission from the intended husband of the young lady that he was then suffering from gonorrhea and that he was responsible for the condition of the patient. When the abdomen was opened there was found quite extensive peritoneal inflammation with the right tube and ovary at the center. The adnexa on the right side were removed and the uterus and left tube irrigated with a solution of mercuric bichloride. This was done for the reason that there was commencing infection in the left tube, from the

distal extremity of which pus was dripping when it was brought up into the wound. The appendix was also removed. The abdomen was closed with drainage tube in lower end of incision. The patient had considerable shock, but recovered. A daughter was born on the 4th inst., a result of the marriage which occurred ten months after the operation.

DR. BOVÉE asked if the infection had been proven to be gonorrheal. Gonorrhea is one of the most frequent causes of sterility in women, and after the tubes become involved pregnancy rarely occurs.

The essay of the evening, by Dr. Moran, was, in the absence of the essayist, read by the secretary. The title was

PUERPERAL ECLAMPSIA.*

DR. SOTHORON congratulated Dr. Moran upon his low mortality.

DR. PRENTISS.—Eclampsia is only a form of toxemia of pregnancy, and the treatment of all forms of toxemia is practically the same. The prognosis can be judged by watching the blood pressure. This steadily increases until the convulsions come on. If we keep the blood pressure record throughout the pregnancy we have an index of the kidney changes. Every obstetrician should have a blood pressure apparatus.

DR. FRY.—A very interesting paper has recently been written on the relation of the thyroid gland to pregnancy. It was found that where the gland enlarged there was not nearly the same likelihood of finding albuminuria as when the enlargement did not take place. If these observations prove to be correct, it will show a very close relation between the gland and the renal functions. Herrman has pointed out the significance from a prognostic standpoint of the amounts of paraglobulin and serum albumin. Until recently it was thought that the pregnant woman excreted a larger amount of urea than normal. For fifteen years he has noticed that the contrary is true. The nitrogenous products are often eliminated in other forms, for when the urea is low the ammonia is high. In considering renal insufficiency we should also consider the total amount of solids excreted. In pregnancy we should consider trifling symptoms more, such as indigestion, biliousness, constipation. When these symptoms supervene he gives calomel and salines. Wright recommends the use of the continued milk diet. We should combine it with the carbohydrates.

DR. STONE wished to say a word in favor of bleeding. It has the same value in proper cases as sweating and purging, and is not so exhausting. Bloodletting is not taught in our school. It is one of the most efficient remedies in eclampsia, and when we lay aside venesection we are giving up one of our most valuable aids.

* See original article, page 609.

TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF LONDON.

Meeting of March 7, 1906.

The President, W. R. DAKIN, M.D., in the Chair.

JOHN D. MALCOLM, F.R.C.S., Edin., read a paper on

PERITONITIS AND THE STAPHYLOCOCCUS ALBUS.

Referring to a view which the author has previously advocated, namely, that inflammation and peritonitis may be aseptic processes, it is shown that Lord Lister distinctly stated that "a certain amount of inflammation, as caused by direct irritation, is essential to primary union."

Turning to the lectures of Mr. Dudgeon and Mr. Sargent on the Bacteriology of Peritonitis, it is pointed out that these observers found the *Staphylococcus albus* in the peritoneal sac in almost every variety of peritonitis, and invariably in the intraperitoneal blood-clot associated with the rupture of extrauterine fetation sacs; they showed that this coccus was frequently in the peritoneal sac when there was no evidence of its presence except that of the microscope, or of culture investigations, and that it was an organism of very low virulence; they nevertheless came to the conclusion that "the febrile disturbances so frequently found after diffusion of blood into the peritoneal cavity are due to the presence of this organism."

It is maintained that the conclusion that the *S. albus* was the cause of the well-marked inflammation attributed to it can be upheld only if it is already regarded as proved that a micro-organism must be present before inflammation can develop. Attention is drawn to the fact that Mr. Dudgeon and Mr. Sargent found in cases of strangulated hernia that "in thirty cases out of a total of forty-six, the intestines, which were in all stages of inflammation and congestion, were found to be sterile."

The effects on an ovarian tumor of torsion of its pedicle are described, and Mr. Doran's observations on the formation of adhesions between the stump of a ligatured ovarian pedicle and the adjacent broad ligament are referred to.

After considering the various possible methods of access of the *S. albus* to the peritoneal sac, its action when present there is discussed.

Mr. Dudgeon's and Mr. Sargent's statement is quoted to the effect that staphylococci show many grades of pathogenicity, and that "even the white staphylococci show all grades of pathogenic virulence." Dr. M. H. Gordon is also quoted as stating that "a differentiation far more elaborate than has yet been supposed to exist, naturally obtains amongst staphylococci."

It is argued that a staphylococcus which is present invariably in intraperitoneal blood-clot, and may exist therein without pus formation for three months, is a different coccus from that which produces suppuration, and the evidence that this nonpyogenic coccus has any harmful effects is considered unconvincing.

CONCLUSIONS.

The following conclusions are arrived at:

1. That inflammation is a curative process bringing about union by first intention, producing a fresh blood supply to strangulated or ligatured tissues or to thin flaps, and causing a return to normal conditions by its characteristic restorative action whenever this is possible, and frequently in spite of the presence of micro-organisms.

2. That tissues in the peritoneal cavity dying because they have become separated from their natural connections (strangulated tumors, ligatured parts, and blood-clot), can be revived only by the inflammatory process and by a consequent formation of the adhesions; that there is no reason to suppose that micro-organisms are necessary to the production of these processes, and therefore that inflammation of the peritoneum may arise without the action of micro-organisms.

3. That, although practically all dangerous inflammations are septic, yet the science of bacteriology, in so far as it is connected with wounds, must be founded on views that recognize the possibility, or rather the constant occurrence, of inflammation in connection with aseptic injuries. This is the teaching of Lord Lister.

4. That when septic complications take place in a wound, the micro-organisms tend to interfere with the proper course of the inflammation which necessarily accompanies an injury.

5. It seems to be certain that a very small damage to tissue may enable slightly pathogenic or innocuous staphylococci to effect an entrance through apparently healthy epithelial surfaces, and perhaps in other ways. The condition is an undesirable and dangerous one, because a little more damage will enable a more powerfully pathogenic organism to invade the tissues, and when a sufficient degree of mischief arises, the most virulent organisms may enter and produce their various effects as if they were introduced through an incision.

6. It is suggested that surgical fever is due to peripheral stimuli and that the theory that fever is necessarily caused by some substance circulating with the blood and acting on a heat center is unsatisfactory, because by it the irritation which occurs in a wound, and which occurs all over the body in septic condition, is entirely ignored as having any possible influence on the temperature.

MR. PERCY SARGENT commented on the manner in which the terms "aseptic" and "sterile" had been used by Mr. Malcolm,

and contended that those terms had been used by himself and Mr. Dudgeon in a different sense; the one to express the meaning ordinarily ascribed to it in Surgery, *viz.*, as applied to a wound which presents no clinical sign of inflammatory reaction, the other, in its strict bacteriological sense. Mr. Sargent held that their experiments, as well as those of Professor Welch, had shown that a wound could be aseptic, and at the same time not sterile; and that organisms could be cultivated from the deeper parts of an aseptic wound several days after the operation. The conclusion to which he and Mr. Dudgeon had arrived that the so-called "chemical peritonitis" does not exist, was based upon the fact that the number of those cases to which the term had in the past been applied was found to diminish rapidly on bacteriological investigation, and that the circumstance of their being unable to demonstrate the presence of micro-organisms in the peritoneal exudate was no proof that the whole of the peritoneal cavity was sterile. It was highly probable that in an area so large as the peritoneal cavity there would be cases in which the presence of micro-organisms would escape detection. At any rate Mr. Malcolm had adduced no experimental work whatever in support of his belief in non-microbic peritonitis. With regard to the nature of the white staphylococcus found so frequently in peritoneal lesions Mr. Dudgeon and Mr. Sargent had been at pains to demonstrate that it was not the same as the staphylococcus pyogenes albus, and they had never suggested that it was the cause of the suppuration which sometimes follows upon an old pelvic hemocele.

SPECIMENS.

MRS. SCHARLIEB showed a specimen from a case of unusual malignant disease of the uterus.

DR. LOCKYER showed (1) the uterine appendages in two cases which illustrated a deficiency in the development of the central part of the Fallopian tubes and congenital hyperophy of the round ligaments. (2) Three cases of diffuse adeno-myoma uteri.

DR. WALTER TATE showed a specimen of carcinoma of the ovary.

REVIEWS.

REFERENCE HANDBOOK OF THE DISEASES OF CHILDREN. For Students and Physicians. By PROF. FERDINAND FRÜHWALD, Chief of Clinic in the Vienna Polyclinic. Edited with additions by THOMPSON S. WESTCOTT, M.D., Associate in Diseases of Children in the University of Pennsylvania. Pp. 533, with 176 illustrations. Philadelphia and London: W. B. Saunders Company, 1906.

The work of Prof. Frühwald, of which this is a translation, is not a text-book intended for systematic study, but rather a brief encyclopedia of the diseases of children available for rapid study of individual cases. The subject-matter is arranged alphabetically, with free cross-references, there being no attempt to group subjects. Pathology has been practically excluded; the author gives merely an occasional reference to the gross lesions. Symptomatology is a leading feature; diagnosis is rarely considered except in a general way in the description of symptoms. The bulk of the work, and that which gives it its chief interest, is the subject of treatment. This reflects the writer's therapeutic methods very fully. Where these are radically opposed to those in vogue in this country editorial notes are inserted in brackets. The author shows a marked predilection for the so-called newer remedies. A large number of these are recommended, though he states that he mentions only those which he is in the habit of using. The illustrations, mostly original, are a valuable feature. H. D.

COMPEND OF OBSTETRICS. Especially Adapted to the use of Medical Students and Physicians. By HENRY G. LANDIS, A.M., M.D., Late Professor of Obstetrics and Diseases of Women in Starling Medical College, revised and edited by WILLIAM H. WELLS, M.D., Demonstrator of Clinical Obstetrics in the Jefferson Medical College, etc. Eighth edition. Pp. 227, illustrated. Philadelphia: P. Blakiston's Son & Co., 1906.

For the student who desires a condensed exposition of the subject of obstetrics and requires the school-room method of question and answer to impress the facts, this is probably the best of the quiz compends published. To the more competent student or to the physician who may wish a hasty reference, the subdivision of the text by frequent questions is rather a detriment, a fact which is beginning to be recognized in some of the more recent medical epitomes. The teaching of this little work appears to be up to date with very few exceptions. Among these is the insertion of the fingers into the rectum, during delivery, to control the head, a procedure generally recognized as

far from aseptic. The description of the technique of catheterization by touch, without separation of the labia or cleansing of the vulva is qualified only by the direction to remove the bed-clothes and look for the meatus if no. promptly successful. The danger of causing cystitis by such lack of aseptic care is obvious. In the description of the conduct of labor, that in the lateral position only is given. These few oversights are in marked contrast to the general good tone of the work. H. D.

TRANSACTIONS OF THE AMERICAN GYNECOLOGICAL SOCIETY. Vol. 30. For the year 1905. Philadelphia: Wm. J. DORNAN, 1905.

Among the papers included in these transactions may be mentioned one by J. Whitridge Williams on Pernicious Vomiting of Pregnancy, the report of a committee on "Uniformity in Pelvic and Cranial Measurements," and a number of papers on each of the following subjects: Uterine retrodisplacements, appendicitis, operations for carcinoma of the uterus, and eclampsia. A number of these have been published in full in this journal, the others in abstract.

ELLIS'S DEMONSTRATIONS OF ANATOMY. Being a Guide to the Knowledge of the Human Body by Dissection. Twelfth edition. Revised and edited by CHRISTOPHER ADDISON, M.D., B.S. (Lond.), F.R.C.S., Lecturer on Anatomy, Charing Cross Hospital Medical School, etc. Pp. 851, illustrated by 306 engravings on wood, of which 75 are in color. New York: William Wood and Company, 1906.

The publishers have put into the hands of American students an English work which has demonstrated its vitality by passing through many editions. It is not a text-book of anatomy, but combines many of the features of such a work with those of a dissecting manual. It is arranged in the sequence usually followed in dissection, thus presenting the structures of each region in their relations to each other rather than as parts of systems. Works of this character are of great value to the student. To facilitate reference a marginal reference is employed. H. D.

TRANSACTIONS OF THE EDINBURGH OBSTETRICAL SOCIETY. Vol. XXX. Session 1904-1905. Edinburgh: Oliver and Boyd, 1905.

Perusal of the transactions of this Society for a number of years leads to the conviction that its members belong to the too-limited class of men, who write only when they have something to say rather than to those who write for the sake of saying something. The brevity and conciseness of the discussions also show either most able editing or a self-restraint most unusual among the frequenters of society meetings. The present volume is no exception to the rule. J. W. Ballantyne describes a case of delayed after-coming hydrocephalic head which was so reduced in size by tapping the spinal canal after death of the

child as to facilitate extraction. R. P. R Lyle gives the history of a case of double uterus and double vagina. The second uterus was myomatous and was impacted in the pelvis. It completely obstructed labor so that Cesarean section was necessary. George G. Bantock defends the use of the pessary in the face of recent papers condemning it. He calls the ring pessary the "abomination of abominations," and condemns the cup and stem variety even more strongly. For cystocele he advocates the diaphragm pessary described in his own book. For rectocele no pessary is of value. For retroversion Albert Smith's modification of the Hodge pessary is best. The material favored by the writer is Britannia metal. A. H. F. Barbour describes a case of climacteric hemorrhage due to sclerosis of the uterine vessels, and treated by hysterectomy. He finds eleven similar cases in literature. E. W. S. Carmichael outlines Bier's treatment of inflammatory affections of the genitals with hot air. Under this method absorption of exudates or suppuration more rapidly supervenes. The treatment replaces the local use of glycerin and ichthyol. It is contraindicated in tuberculous peritonitis, uterine edema, with high fever, during menstruation, and with certain diseases such as cardiac affections. G. F. B. Simpson reports a case of fatal complete irreducible prolapsus uteri. A clinical and pathological analysis of 120 abdominal hysterectomies for fibromyomata by F. W. N. Haultain leads him to advocate hysterectomy for the majority of interstitial and subperitoneal fibroids which give rise to symptoms when under forty-five years of age, in all cases with urgent symptoms at any age when myomectomy cannot readily be performed. When no symptoms exist he would not even acquaint the patient with the fact that the condition exists. J. W. Ballantyne writes of lumbar puncture for eclampsia. He believes it may prove useful in those cases in which the chief indication is to control the convulsions and gain time for other measures. Twenty cases besides the author's have been reported, five of which have ended fatally. The same author describes a case of Malta fever, beginning when the patient was about five weeks pregnant. Labor occurred normally at term, the pregnancy not being affected by the disease or by large intramuscular injections of quinine. A. R. Simpson records cases of ovariectomy in a mother and two daughters, all of whom had ovarian cysts. They are reported as instances of heredity of ovarian disease. Malcolm Campbell has found in twenty cases of uterine fibroids that the ovaries showed the function of ovulation to be in abeyance and that there were well-marked retrograde pathological processes in connection with the Graafian follicles and corpora lutea. He does not attempt to decide whether these changes are probably causative of the fibroid growths or secondary to them. "Curiosities of Curetting" is the title of a paper by Sir Halliday Croom dealing chiefly with the diagnosis of cancer and accidents attending the operation.

F. W. N. Haultain describes a series of sixteen cases of axial rotation of pelvic organs and tumors. James Brownlee presents the results of bacteriological examination of the uterus and vagina during the normal puerperium in twenty cases. A. H. F. Barbour reports cases of sarcoma of the cervix and endothelioma of the ovary, and J. A. Kynoch one of distended gall-bladder simulating ovarian cyst.

DIE SCHWANGERSCHAFTSLÄHMUNGEN DER MÜTTER. (PREGNANCY-PARALYSIS.) By Dr. RUDOLPH VON HOESSLIN, Arzt der Curanstalt Meuwittelsbach bei München. Berlin, 1905, August Hirschwald.

The author considers only those paralyses which have a positive etiological connection with pregnancy, labor, and the puerperium, and endeavors to classify them according to their pathological anatomical lesions as follows:

Central pregnancy-paralysis without pathologic-anatomical lesion. (a) *Hysterical pregnancy-paralysis.* The following is a good illustration: A sixteen year old 1 para, who during the first month had attacks of severe vomiting and during the fourth month complete paralysis of the lower extremities, had, fourteen days after delivery, relaxed paralysis without contractures. Her tendon reflexes were increased and there was marked disturbance of sensibility, especially on the left side. The extremities appeared cold and cyanotic. The electrical examination showed no contracture anomalies in the nerves or muscles. After employment of the faradic current there was gradual improvement of the paralysis. Six months later the patient could walk with the aid of a cane, but with tremors of the entire body, especially the head. At times there was aphonia. This paralysis disappeared very rapidly, after discussing in the presence of the patient the desirability of using the actual cautery.

Hysterical paralysis must be considered rare. The influence of pregnancy on hysteria is slight, although in rare cases hysterical paralysis may occur in the form of hemiplegia or monoplegia. If a careful examination is made, the hysterical and reflex paralyses may usually be traced to inflammatory processes in the pelvis or to neuritis. A hysterical paralysis during pregnancy or in the puerperium should be diagnosed only if there are positive indications of the functional character of the paralysis and if organic changes in the nervous system can be excluded. The prognosis is good.

(b) *Pregnancy-paralysis from myasthenia gravis.* Labor and protracted nursing seem to have a more detrimental influence than pregnancy on women predisposed to myasthenia.

Cerebral Pregnancy-Paralyses.

(a) *From simple apoplexy.* This occurs almost without exception during the second half of pregnancy. The variations in the blood pressure as they occur during the "bearing down" of labor,

play an important part as etiological factors. The prognosis is doubtful if the apoplexy occurs during labor. It is better if the apoplexy occurs before or after labor.

(b) *Albuminuric pregnancy-paralyses*. Two distinct pathologic anatomical conditions must be held responsible; first, cerebral edema, and, second, cerebral hemorrhage. They invariably occur during the second half of pregnancy, generally at the end, during labor or in the puerperium. Prodromata usually precede them. Albuminuric amaurosis may occur before or after delivery, with or without eclampsia.

(c) *Pregnancy-paralyses from thrombosis of the cerebral vessels*. Independent of the large losses of blood and infectious puerperal processes, the extreme weakness present in some women and the associated diminished circulation vigor, may be sufficient to lead to cerebral thrombosis. The slow, more or less step-like development of the paralysis and of the remaining symptoms is characteristic. The first symptoms manifest themselves without loss of consciousness, which may be entirely retained, or be lost only during the later stages. In 24 cases of which the author has notes, hemiplegia was present 23 times, 8 times left, and 11 times right-sided, the latter usually in connection with disturbance of the function of speech. Convulsions are frequent, because of the superficial site of the thrombosis. The prognosis is grave.

(d) *Pregnancy-paralyses from cerebral embolism*. It has been established with certainty that previously existing endocarditis is likely to have acute recurrences during pregnancy. It is also possible that in connection with inflammatory processes in the uterus and adnexa, or with a septic phlebitis, thrombi may be loosened from the occluded veins and through an open septum be transported into the greater circulatory system. The prognosis is rather favorable.

The *spinal lesions*, in their relations to pregnancy, must be divided into two groups:

1. *Those which existed before impregnation* and were not influenced by the pregnancy and its consequences, and those that were so influenced.

2. *Spinal lesions that develop during pregnancy* or during the puerperium. (a) Independent of the pregnancy. (b) dependent on the pregnancy.

Class 2 (b). The loss of blood during delivery plays an important role in the development of spinal pregnancy-paralyses; likewise of infectious processes during the puerperium. We must consider as immediately dependent upon pregnancy those spinal diseases in which, in consequence of uterine hemorrhage during pregnancy or delivery, spinal paralysis occurred. The first symptoms of multiple sclerosis may manifest themselves during pregnancy and during the puerperium.

To explain why in one pregnant woman a nephritis, in another

chorea, in other tetanus, diabetes, or myelitis develops, individual predisposition must be held accountable.

Spinal paraplegia in connection with albuminuria has an unfavorable prognosis. An acutely developed paraplegia is much more unfavorable than those of gradual development, and frequently causes the birth of a dead infant with succeeding death of the mother. The influence of central paralyzes on conception, pregnancy, and delivery seems to be nil.

Peripheral Pregnancy-Paralyses.

(a) *Osteomyelitic paralysis.* This localizes itself in the beginning in the pelvic upper thigh muscles, especially the ileopsoas, quadriceps, adductors of the thigh, and in the extensors; only later do other muscles become affected.

Osteomalacia is frequently not recognized. The osteomyelitic paralyzes are differentiated from myelitis by the local grouping of the paralysis, the absence of bladder and rectal symptoms, and the existence of sensitiveness to bone pressure.

The Neuritic Paralyses.

(a) *Traumatic neuritis puerperalis* must be ascribed to disproportion between the head and the pelvic diameters, and the consequent long-continued pressure of the head on the pelvic nerves. Very forcible traction on the feet in instances of after-coming head may also be an etiological factor. Most cases of traumatic neuritis may be traced to forceps delivery. In 81 cases known to the author forceps were used 61 times. Pathognomonic of traumatic neuritis *ex partu* is the manifestation of paresthesia, pain or paralysis during or immediately following delivery. The most prominent symptom during delivery is a severe paroxysmal pain in the hips or lower extremities with each labor pain or every time traction is made with the forceps. The severe pain in the gluteal region is ascribed to pressure on the superior and inferior gluteal nerve, coming from the dorsal part of the lumbosacral plexus.

The most constant symptom is severe lancinating pain, beginning during labor, and soon followed by paralysis on the posterior surface of the thigh, the outside of the leg, and the dorsal surface of the foot. The prognosis depends on the extent of the paralysis.

(b) *Neuritis puerperalis per contiguitatem aut propagationem.* Pain and weakness of the lower extremities in consequence of inflammatory affections of the pelvic organs are so frequent that a genital examination should be made in each instance when a woman complains of such symptoms. Inflammatory processes associated with or following pregnancy cause similar symptoms in the lower extremities. The neuritis which arises in consequence of pelvic inflammation is not likely to manifest itself immediately after delivery, but usually develops during the puerperium. Paralysis seldom occurs suddenly, but it develops gradually, requiring

some time before its maximum is reached. The prognosis depends upon the original ailment. The differential diagnosis from other paralyses is ascertained by the local condition; it is made more difficult when in addition to local pelvic inflammation etiological moments for other forms of paralysis are present.

Toxic pregnancy- and puerperal-neuritis is one of the most important and interesting of pregnancy paralyses which develop without puerperal infection. In those cases in which but few nerve complexes are affected, a preference is shown for the nerves of the forearm, especially the ulnar and median. Degeneration of extremity nerves is the most constant lesion found. The prognosis is favorable if the affection is not diffuse. Spontaneous abortion or delivery has seemingly no favorable influence on the polyneuritis developed during pregnancy; in fact it has seemed that the toxins which originally caused the neuritis are formed to even greater extent during involution of the genital organs. An unusually large number of clinical citations enhance the value of this work for the practitioner.

BOLDT.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Ectopic Pregnancy.—C. A. McWilliams (*Med. Rec.*, Dec. 16) has traced the after history of 24 patients operated upon for ectopic pregnancy. Four of these had had vaginal operations, most of them probably being instances of tubal abortion. Three of these had normal pregnancies following operation. None had a recurrence of the ectopic pregnancy. Twenty patients had laparotomies for extrauterine pregnancies, the affected tube and ovary usually being removed. Five of these afterwards had full-term children; two of them required subsequent operations for second extrauterine pregnancies. Thirty-three per cent., therefore, in this series, had subsequent normal pregnancies, and 8 per cent. had secondary extrauterine gestations, requiring immediate operation.

Pyelonephritis in Pregnancy.—Ernst Ruppner (*Munch. med. Woch.*, Feb. 6, 1906) says that two factors are necessary for the production of a pyelonephritis: an inflammation-producing germ and conditions favorable to its action. The bacillus coli is the most frequent cause in pregnancy as at other times; but other microorganisms, such as the streptococcus and staphylococcus, may act as agents. Infection may ascend from the bladder or come from the blood itself. Pressure of the pregnant uterus on the ureter favors the origin from the bladder and vagina. Pressure causes inflammation of the ureter, retention of urine in the pelvis of the kidney, desquamation of the epithelium and bleeding, and the bacillus increases all these signs. Pressure is more frequent on the right ureter,

and right pyelonephritis is the more common. Kidneys that have been previously diseased more easily take on pyelonephritis. Some believe that chemical changes of the urine predispose to it. It generally begins during the middle months of pregnancy. It may come on suddenly with chills and fever and much pain, or gradually. It appears also in attacks, the time between being free from symptoms. There may or may not be cystitis, but pain is referred to the bladder and micturition is frequent. The urine is acid and contains pus, a little albumin, but generally no casts until an advanced stage is reached. There are blood cells, calcium oxalate crystals, and bacteria. There is pain on pressure over the kidneys and muscular resistance, but a tumor can rarely be felt. The condition is not dangerous to the life of mother or child, and the kidney condition improves after delivery. Spontaneous abortion occurs in 20 per cent. of the cases. Rest in bed on the back or side is the best method of treatment. Urotropin, salol and aspirin are useful to disinfect the urine. Lavage is necessary only when cystitis complicates the kidney condition. Alkaline mineral waters are useful. In a few cases premature labor must be induced. Surgical interference is justifiable in severe cases.

Lumbar Puncture and Veratrum Viride in Eclampsia.—F. Mirto (*Ann. di Ostet. e Gin.*, Dec., 1905) has examined the 16 cases of eclampsia reported by Henkel, in which lumbar puncture was performed to relieve the supposed increase of tension of the cerebrospinal fluid, and shows that the increase in fluid is not present in all cases, the canal being found empty in some. He believes that increase in the amount of the cerebrospinal fluid is not of much influence in the production of eclampsia. At the same time the treatment was not markedly successful. The author recommends the use of veratrum viride for reducing the pressure of the blood in such cases, using hypodermic injections of an extract of the drug. He observes that as often as the blood pressure rises an attack of convulsions may be feared. The reduction of the arterial pressure by veratrum is successful in warding off the attack in many cases; in some it prevents the repetition of the attacks, and in some it has succeeded in permitting the pregnancy to go on to term and the child to be delivered normally. He cites 61 cases in which it was used in this way in the obstetric clinics at Pavia and Milan, with only six deaths. It was used as a preventive in many other cases with high tension and albumin and casts in the urine, in whom no attacks of eclampsia developed. Although the increase of pressure may not be the cause of the convulsions, it is the invariable accompaniment of them, and is an index of the probable appearance of the seizures.

Relation of the Kidneys to Eclampsia.—Philip K. Brown (*Jour. Amer. Med. Assn.*, Jan. 13) finds that albumin is present

in fully 80 per cent. of normal pregnancies, and that albumin and casts are found in at least 30 per cent. of all pregnancies. There is no reason to suppose that the renal condition thus revealed is the cause of eclampsia; but that there is some connection between the albuminuria and extrarenal cause of eclampsia is likely on account of the nearly constant association of the two. It has been shown that neither any normal end product, nor any known intermediate product of metabolism is the cause of eclampsia. It is reasonable to suppose that deficient thyroid or parathyroid activity plays a part in some cases of eclampsia. The most significant experimental work points to the fact that the toxic substances which probably are responsible for eclampsia are formed in the placenta. There is good evidence that these same substances are probably the cause of the headache, edema, abdominal pain, and particularly the albuminuria present in non-eclamptic and non-nephritic cases. The nervous system of pregnant women is in an abnormally sensitive condition. Their blood has been shown to be abnormally toxic. There is no conclusive proof of an increased or diminished toxicity of the urine.

Abdominal Section During Pregnancy.—Alban Doran (*Four. Obst. and Gyn. Brit. Emp.*, Nov.) reports two operations performed during pregnancy. One was the removal of a two-pound, sessile fibromyoma. This growth was continuous with the back and fundus of the uterus and firmly adherent to the back of the left broad ligament. The patient made a good recovery and was delivered at term of a normal child. The second case was a fibroid arising from the back of the broad ligament. During the removal of this growth the posterior layer of the mesosalpinx was torn and it was deemed advisable to remove the appendages on that side. This case went to term normally. The writer finds it advisable to remove these pelvic tumors during pregnancy, as there is comparatively little risk.

Experimental Withdrawal of Liquor Amnii.—B. P. Watson (*Scot. Med. and Surg. Jour.*, Jan.) draws the following conclusions from a series of experiments on rabbits. The withdrawal of the liquor amnii causes the death of the fetus at once, death being due to arrest of the vitelline and allantoic circulation. The dead fetus and its placenta are retained *in utero*, and the former undergoes degenerative processes and becomes flattened. The changes in the fetal and maternal placental tissue are different. The fetal part slowly degenerates, the mesoderm becoming invaded by fibrin and the cells of the ectoderm undergoing a granular disintegration. There is no proliferation of the ectoderm after fetal death. The changes in the maternal portion of the placenta do not differ essentially from those that occur during normal development. The placenta becomes detached in the same manner as the normal placenta. Secretion of liquor amnii ceases on the death of the fetus.

Fetal Achondroplasia with Alterations of the Placenta.—Egidio Marconi (*Ann. di Ostet. e Gin.*, Dec., 1905) describes a case of macerated fetus combined with enormous placenta, much altered in constitution, occurring in a woman who had shown some evidences of syphilis. The limbs of the fetus of seven months were very small, entirely out of proportion to the size of the body. The skeleton was so little developed that the author denominates it a case of achondroplasia. The placenta was enormous, pale in color and friable. Some of the villi were of normal size, while others were large and entirely destitute of blood-vessels. The author believes the achondroplasia to have been the result of the alterations in the placenta, which were due to some infective cause, perhaps syphilis. The changes are truly toxic in origin, the toxin producing a disturbance of function in the placenta and an alteration in development as a result. There is some evidence to show that such deformity is hereditary.

Superfetation and Causes of Error in Its Interpretation.—L. Bouchacourt (*L'Obstet.*, Jan., 1906) says that for superfetation to occur, two conditions must be present: ovulation must continue during pregnancy, and the spermatozoon and the ovule must meet in spite of the mechanical obstacle of the pregnancy. There is plenty of evidence to show that ovulation does continue during pregnancy. The ovule and spermatozoon may meet easily enough if the first pregnancy is extrauterine. When the uterus is bifid the double impregnation is easy. Most authors believe that superfetation cannot occur in a normal uterus. But up to the beginning of the fourth month the union of the fetal coverings with the uterine walls is incomplete. The expulsion of two living and viable fetuses at different epochs separated by months, would seem to indicate two different impregnations. The author thinks that error may arise from the different development of the two fetuses in an ordinary twin pregnancy, one being retained longer than the other. The expulsion at the same time of two unequally developed fetuses may be accounted for in the same way. The author believes that anatomical and radiological examinations of the two fetuses should be made in order to demonstrate the differences in periods of development.

Dwarfs from the Obstetrical Point of View.—Alphonse Herrgott (*Ann. de Gyn. et d'Obst.*, Jan. 1906) discusses the different conditions that produce dwarfs, the result to the bones of the pelvis, and the operations required to accomplish delivery. There are dwarfs who are well proportioned in all respects and in whom delivery is normal. Myxedematous women are sometimes dwarfs, but the genital organs generally are dwarfed also, and the occurrence of pregnancy is infrequent. The pelvis is generally contracted, all the diameters being diminished. It preserves the infantile type. Rachitic pelves are uniformly con-

tracted as a result of softening of the bones, inequality of growth, pressure and muscular contraction. The contraction is often so great that delivery requires Cesarean section. The pelvis may also be flattened so that the conjugate is not more than 2 cm. in diameter. Achondroplasia gives a very much contracted pelvis. It is a result of defective periosteal ossification and is hereditary. The bones of the limbs are badly developed, while the skull is of normal size. These people are often no more than a yard tall. The author tells of a family of dwarfs, among whose ancestors and relatives there were many cases of achondroplasia. The father and two daughters were dwarfs, while mother and nine other children were of normal size. Two Cesarean sections were performed by the author upon one daughter. Several female relatives had died in labor. The author calls our attention to the fact that the origin of the contraction of the pelvis in dwarfs has much bearing on the prognosis in labor and the operation of choice. In achondroplasia normal labor is impossible and none of the operations except Cesarean section give any hope of a living child. Rachitic pelvises may be equally contracted, and delivery may be possible only after section, but in other cases the contraction is less marked and premature delivery, or symphyseotomy may permit of delivery. Contraction of the pelvis may be prevented by treatment of rachitic children, but achondroplasia is congenital and irremediable.

Extraction of the Head Separated from the Trunk and Retained in the Uterus.—Trillat and Latarjet (*L'Obstet.*, Jan., 1906) endeavors by means of an analysis of the published histories bearing upon this subject to arrange some rules for the conduct of the labor after the head has been separated from the trunk. The head may become separated either as a result of an accident in a normal labor, a breech presentation or a version, or as a surgical measure deliberately undertaken to lessen the difficulty of the extraction. Seventy-four published histories were collected by Frangopoulos, to which may be added four others by Thenoua. Detruncation arises from maceration of the fetus diminishing its resistance, or from incomplete development; with a normal fetus it may result from too violent efforts at extraction, or violence exerted in a wrong direction. During the first six months of pregnancy the condition is easily accounted for by the partial development of the fetus and the disproportion of the large head to the undeveloped body. During the last three months the mechanism is more complex. The head may be retained by some obstacle in the pelvis or in the uterus. The pelvis may be generally contracted or asymmetrical, and may oppose the expulsion of the head. In the uterus, retraction of the ring of Bandl, rigidity of the os, or congenital malformations such as a bifid uterus may constitute the obstacle. On the other hand the obstacle may be the excessive size of the head, as in hydrocephalus. Results of this accident are expulsion,

which rarely occurs after an interval of a few hours, more often after an interval of three to twenty days, the interval being complicated by the results of the presence in the uterus of a septic body. This spontaneous expulsion is facilitated by maceration and reduction in size of the head. It occurs easily when the head is fixed and engaged in the pelvis in a transverse position. In other cases the mentopubic position of the head and rigidity of the neck prevent this evolution. Later the head becomes softened, reduced in volume, and is expelled like placental débris with a more or less pronounced infection. A prolonged retention is much more frequent. It may remain for years with comparatively little disturbance to the woman, and the bones be expelled in fragments. Infection is the most serious complication. Early hemorrhage from the partially detached placenta may be severe. Early uterine rupture is a rare complication. The bones may become dislocated and migrate from the uterus to other organs by way of fistulæ, and may be finally expelled through these fistulæ. The uterus becomes inflamed and contracts on the fragments and pushes them through the walls of other organs. The bones have passed into the bladder, the intestine and the cellular tissues of the hypogastrium. Fistulæ may be vesicouterine, rectovaginal and intestinal. Prognosis varies with the period after the accident. The patient usually dies when no interference is undertaken. When the patient survives sometimes a metritis arises and perforation or sepsis renders the prognosis grave. Treatment demands immediate extraction: this may be done by the vagina by introducing the hand into the uterus and hooking a finger into the mouth so as to change the position of the head, and with the aid of the external hand and fixing it, expulsion is carried out. This method can be used only during the first few hours and in the absence of contraction of the uterus. Hooks may be used in the mouth instead of the finger. The head may be crushed and thus reduced in size, or the cranium perforated and the soft contents allowed to drain away. By way of the abdomen, extraction may be done after the os has closed, or when the head is in one horn of a bifid uterus. Of the cases tabulated by the author, 67 in number, there were 14 of spontaneous expulsion, 11 of manual extraction, 14 of instrumental extraction, 17 of craniotomy, 1 of symphyseotomy, 6 of Cesarean section, 3 of Porro's operation, and one of Cesarean section with Porro's operation. In abortion the extraction should be manual. When the operator has made the separation and there is no obstacle to expulsion the removal is easy. When the pelvis is contracted the size of the head must be reduced. When extraction by the vagina is impossible the abdomen must be opened. In case of severe hemorrhage the placenta must be removed manually. If it arises from the lower segment of the uterus the uterovaginal tampon must be introduced.

Cesarean Section.—R. Olshausen (*Zent. f. Gym.*, Jan. 6, 1906)

sums up the results of 118 Cesarean sections: 91 for contracted pelvis, 7 for eclampsia, 6 for myoma, 4 for carcinoma, 4 for vagino-fixation, 2 for nephritis, 2 for vitium cordis, 2 for stenosis of cervix or vagina. Of the contracted pelvis 71 were rachitic. In eclampsia the operation is indicated only in the severe forms in which only very rapid delivery can save the child and mother. The technique includes the following important points: the incision in the abdomen should be very high up, so as to enter the uterus at its broadest part. It should go considerably above the navel, and end 8 cm. above the symphysis. The uterine incision should avoid the placental site, which may be located by the increased circulation in the uterine wall; anterior or posterior uterine wall may be opened. There is no fear of hemorrhage if ergot has been given before the operation; it may be given before the anesthetic, and 20 minutes before beginning the operation, as a 6 per cent. watery solution of ergotin, using 1 or 2 grams of the solution. No ligature about the cervix will be needed to control bleeding. In 7 patients the section was done twice, in 2 three times, in 3 four times. Of 91 operations for contracted pelvis, only 9 were fatal.

Cesarean Section in Death from Heart Disease.—W. Nacke (*Zent. f. Gyn.*, Feb. 17, 1906) declares that by carefully observing the fetal heart action, a living child may be delivered after the mother has drawn her last breath in death from heart disease. He describes the delivery of a child in this way, by him, after the death of a patient who had mitral stenosis in a marked degree, with a much hypertrophied right ventricle. The child was delivered living after she had ceased to breathe, but was asphyxiated and died as a result of some rather violent efforts to establish respiration. He considers that if we operate while the woman is moribund we may injure her chance of life and get no better results to the child. While in eclampsia the use of an anesthetic will be of no detriment, because the heart is strong and arterial tension high, in cases of heart disease, anesthesia is impossible and shock is a great danger.

Cesarean Section in the Death Agony.—R. Lumpe (*Zent. f. Gyn.*, Feb. 17, 1906) gives the indications for Cesarean section in the death agony thus, after Runge: When the diagnosis and prognosis of the physician tend to show that death in a short time is inevitable, the child is living, a delivery by way of the pelvis gives no hope of life for the mother, and the section cannot lessen the chances of life the operation is indicated. Cesarean section gives the best chance for the life of the child, while the death of the mother must soon occur. The author describes a birth by Cesarean section observed by him. The mother had had an attack of apoplexy with paralysis of the left side, and before labor came on another attack occurred, the condition becoming hopeless. There was Cheyne-Stokes respiration, inequality of the pupils and coma. A living child was

delivered by Cesarean section, which lived eleven hours after birth. The cause of the mother's death was ascertained to be a hematoma over the left hemisphere, which had become organized.

GYNECOLOGY AND ABDOMINAL SURGERY.

Ureteral Fistulae after Gynecological Operations.—P. Sfameni (*Arch. di Ostet. e Gin.*, Nov. 5 and 10, 1905) brings up 21 cases, most of them observed by himself, in which a supposed fistula of the ureter closed spontaneously about the time that the wound healed. He believes that these cases were persistences of the duct of Malpighi-Gartner, which is the duct of the primitive kidney at one period of development of the fetus. It is the duct of the Wolffian body, and should this persist in the adult, it is conceivable that the irritation of the operation might produce a secretion of the gland, which would cease at the time of healing of the wound. In these cases the flow of fluid from the supposed fistula does not occur immediately, as it should if the ureter had been wounded during the operation, but comes on from three to thirty-nine days after the operation. Unfortunately, the fluid was examined in only a few cases; but in these it was found to differ from the urine drawn from the bladder of the same patient in having a lower specific gravity and containing no urea. The author contends that this is sufficient to prove that it is not urine. The duct of Malpighi-Gartner opens in various locations, sometimes very near the vulva, always at some point in the vagina. When the supposed ureteral fistula has been closed by operation, this has, in some cases, resulted in pain and the appearance of a fluid tumor in the wall of the vagina. The author believes that all such cases as occur some days after operation and are spontaneously cured at the healing of the wound, are cases of persistence of the Wolffian body, and the duct of Gartner into adult life, and secretion as a result of the operation performed.

Vesical Calculi in Women.—C. G. Cumston (*Four. Obst. and Gyn. Brit. Emp.*, Nov., 1905) says that medical treatment is applicable only in cases of acid lithiasis. It consists in diet, hygiene, and alkaline medication. The surgical treatment consists of an urethral dilatation, vesico-vaginal or suprapubic cystotomy and lithotritry. Dilatation will allow the extraction of calculi exceeding 3 cm. in diameter. Suprapubic cystotomy should be reserved for cases of large calculi in young girls. Colpocystotomy is to be resorted to in cases where the stone is large or extremely hard or is developed around foreign bodies and becomes lodged in the bladder; also in cases of vesical infection. Lithotritry would seem to be the method of choice when the stone is friable and of medium size. It is followed by the spontaneous expulsion of fragments, should any be left behind after the operation is completed, and allows the patient to resume her ordinary life within a few days, if preceding in-

flammatory complications of the bladder do not require drainage of the organ.

Tuberculous Peritonitis.—According to W. T. Cummins (*Univ. Penn. Med. Bull.*, Dec.), approximately 25 per cent. of all necropsies show active tuberculous foci; 3 per cent. show tuberculosis of the peritoneum. Of all forms of peritonitis, 25 per cent. are tuberculous. Females are less subject to tuberculous peritonitis than males, in the proportion of 1 to 2. It is most prevalent between the ages of 20 and 40. After the fiftieth year the disease is rare in females. Cases are more frequent in the negro race. Genital tuberculosis in women is responsible for about 40 per cent. of the cases. In laparotomies the fibrous form of the disease gives the greatest percentage of cures, and the ulcerous the smallest. The average mortality is about 3 per cent.

Peritoneal Drainage.—John L. Yates (*Surg. Gyn. and Obst.*, Dec.), after a series of experiments on the local effects of peritoneal drainage, comes to the following conclusions: Drainage of the general peritoneal cavity is physically and physiologically impossible. The relative encapsulation of the drain is immediate, and the absolute encapsulation occurs early and can be retarded but not prevented. The serous external discharge is an exudate due to the irritation of contiguous peritoneum by the drain. There is a similar inward current from the potential into the general cavity. The external exudate diminishes remarkably with the formation of encapsulating adhesions. The adhesions, under normal conditions, form about any foreign body, and their extent and density depends on the degree and duration of the irritation. Primarily fibrinous, the adhesions become organized in a few days (three days in dogs). After irritation ceases, their disappearance depends principally upon a mechanical factor—the ability of the involved surfaces to pull themselves, or to be pulled, loose. Drains should be the least irritating, and should gradually and finally be removed as soon as possible. After a drain is inserted all intraabdominal movements should be reduced to a minimum. After their removal, intraabdominal movements should be stimulated, to aid the disappearance of remaining adhesions. A drain in the presence of infection is deleterious to peritoneal resistance. Postural methods, unless destined to facilitate encapsulation, are both dangerous and futile, as far as drainage is concerned. Peritoneal drainage must be local, and unless there is something to be gained by rendering an area extra-peritoneal, or by making from such an area a safe path of least resistance leading outside the body, there is, aside from hemostasis, no justification for its use.

Pelvic Suppuration.—In the treatment of pelvic suppuration, Ralph Worrall (*Brit. Gyn. Jour.*, Nov.) advocates the systematic employment of both routes. In all cases in which

it is evident from the symptoms and physical signs, that pus exists in the pelvis, the treatment should be operative. When the patient is desperately ill, operate at once. When it appears that the patient is likely to improve with rest and supporting measures, postpone operation until the symptoms have subsided and the temperature becomes normal. Opening of the abdominal cavity should always be preceded by curettage at the same sitting. Always open the abdominal cavity first through the posterior vaginal fornix. If serious constitutional symptoms are present at the time of operation, and if the pus can be evacuated through the posterior fornix, the pelvis should be thoroughly cleansed, powdered with iodoform and the pus sacs lightly packed with gauze. In a week the patient's condition usually is so much improved that abdominal section may be performed and the pus sacs removed. If there are no constitutional symptoms, remove the pus sacs at the time of the first operation. If the uterus or appendix appears to be involved in the septic process, it should be removed. Flushing should be omitted, except when there is general purulent peritonitis.

Etiology of Flatus Vaginalis.—F. Kosminski (*Zent. f. Gyn.*, Dec. 16, 1906) distinguished between the outrush of air from the vagina which takes place after the use of the speculum, when the upright position is quickly assumed, and which is not noticeable when the patient gets up slowly, and true garrulitas vulvæ. This is due to relaxation of the walls of the vagina and the sudden pressure on the abdominal contents as a result of gravity. There are other cases in which the air passes from the vagina when the patient is in an ordinary position, and this is true garrulitas vulvæ. Veit believes the gas to be produced in the vagina by the action of microorganisms. The condition may begin during the puerperal period and cause the patient to believe that she has been torn and that the sound and unpleasant sensation are due to an unrepaired lesion of the perineum or vulva. The author thinks that it is impossible that so large a quantity of gas could be produced in the vagina by microorganisms. In many such cases there is no slimy secretion present such as would be found with microorganisms acting in the vagina. A bacteriological examination of the vaginal secretions would decide the matter. The gas may come from a concealed fistula communicating with the bowel, and such a fistula should be looked for. But in most cases the condition is due to a suction of air into the vagina through a relaxed vaginal orifice and its expression by the movements of the body.

Treatment of Inflammatory Tumors of the Adnexa.—Steffeck (*Munch. Med. Woch.*, Dec. 12, 1905) says that, in Berlin, inflammatory lesions of the adnexa following gonorrhea or abortion form 56 per cent. of the clinical material. He takes up the

various methods of treatment. In acute cases the only remedy of any use is rest in bed until all pain is over and bimanual examination shows that all exudation is ended. In some few cases the increase in the size of the tumor is so rapid that immediate operation is demanded. In such cases he uses incision by way of the vagina, emptying of the abscess and drainage. In less urgent cases the expectant treatment is in order. For chronic cases the treatment varies with the size of the tumor and the severity of the symptoms. The symptoms are not commensurate with the size of the tumor. Conservative treatment should be used until the physician is sure that it will not cure the patient; then operation should be undertaken. When the lesion involves the tubes alone, the ovaries not being affected, in young persons the treatment is of more avail. The author rejects hydrotherapeutics and massage. Ichthyol tampons are harmless. The best treatment is that by hot air; next to that hot baths for one hour and a half daily are most useful, especially for old exudates. Operation by laparotomy is not to useful, according to the author, as by way of the vagina. Simple vaginal incision is best in young women in whom the menstrual function is to be preserved, when the ovaries are not involved. This he has used in 35 cases with two recurrences. Extirpation of the adnexa is indicated for tubal disease complicated with ovarian troubles. The author believes that the operation may be done so that the operator can work seeing the field of operation and not in the dark. He has done 85 operations with only one death. Total extirpation of uterus and adnexa is necessary in those old cases in which all the organs are matted together by exudate. He had done this operation in 23 cases. Thus he has performed 145 vaginal operations with two deaths, or 120 with one death, in cases where laparotomy might have been done. His mortality is 1.38 per cent. against Henkel's of 4.2 per cent. by laparotomy.

Secondary Ovarian Tumors.—J. A. Amann (*Munch. Med. Woch.*, Dec. 12, 1905) tells us that formerly it was the general belief among physicians that secondary ovarian carcinomata were of rare occurrence, but he believes that they are quite frequent. They may be very large and exist on both sides, so as to completely mask the presence and symptoms of the primary growth, which is usually in the stomach or intestines, the ovarian tumors being metastatic growths. The author distinguishes three types of these carcinomata: (a) the hard carcinomata, (b) the edematous fibromata with epithelial nests, (c) cystomata with carcinomatous inclusions. They resemble in many ways the endotheliomata. Primary ovarian carcinoma has few metastases, and those are in the peritoneum, never in the stomach. The ovary is a favorite seat for the metastatic growths of the stomach, mammae, intestine, uterus, gall bladder and skin. The path of the metastasis is by way of the lymphatics

of the abdomen, through the blood, or by direct contact infection intraperitoneally. In all cases of ovarian carcinoma the stomach should be carefully palpated and its contents examined. The primary tumor is often so small that it may escape observation. When it is found the author believes that the ovarian tumor should still be removed on account of the comfort given the patient by the removal of the large and heavy mass. When there is stenosis of the bowel an enteroanastomosis should be done to relieve the symptoms.

Treatment of Retrodisplacements.—C. W. Barrett (*Surg. Gyn. and Obst.*, Nov.) describes the following operation for retrodisplacements: The abdomen is opened in the median line and the round ligaments picked up by rubber-jaw forceps and a control ligature is thrown around each ligament about $2\frac{1}{4}$ inches from the angle of the uterus. The edge of the aponeurosis over the rectus muscle is now grasped close to the lower angle of the wound, and a curved ligature-forceps is carried between the aponeurosis and the rectus muscle to the internal ring, where the forceps is passed through the ring. The forceps now grasps the control ligature on the round ligament and is withdrawn, bringing a loop of the round ligament with it. Each round ligament is sewed with catgut to the under side of the aponeurosis, about one inch from the median line, and if the loops are long enough they should be fastened together in the median line. This operation uses the best part of the ligaments. It creates the least possible pathology, forming no new ligaments, and while it holds the uterus firmly it allows the normal range of movement.

Uterine Curettage.—M. Pichevin (*Bull. de la Soc. d'Obst. de Paris*, Dec. 21, 1905) advocates the use of uterine curettement in cases of puerperal infection, the operation being done early in the case and completely and rapidly executed. Its indications are distinct: whenever septicemia is well marked the uterine cavity must be thoroughly cleaned out and made as aseptic as possible by vaginal lavage. When so done curettement prevents affections of the tubes and ovaries rather than causes them, as some authors have maintained. The patients that are treated by curetting recover very rapidly, while those that are given intrauterine douches alone are very slow in regaining health and strength. Generalization of the septic process is a contraindication to the operation. As long as the focus of infection is within the uterine cavity it is applicable; when septicemia has invaded the muscle, the vessel, ovaries, or tubes it is too late to expect benefit from curettage. As soon as the temperature is persistently elevated, the facies anxious and the pulse rapid it is time to empty the uterus of any placental material present. Digital curettage is good in some cases but insufficient in most; the curette is preferable as being more thorough and able to reach all parts of the cavity, and should be followed by lavage. Hemorrhage and perforation are real dangers, but may be prevented by care.

Vaporization of the Uterus.—Karl Baisch (*Zent. f. Gyn.*, Jan. 6, 1906) says that vaporization has its uses in spite of the deaths which have followed it, and which have shown that the method is not without danger. The cause of these failures has been the selection of cases entirely unfitted for it. It has produced in unsuitable cases serious inflammations of the adnexa, phlegmasia, thrombosis and obliteration of the uterine cavity. On the other hand it has given very good results in well-selected cases. If vaporization is used one day before a total extirpation of the uterus, and the organ examined after removal it is found that a burn of the third degree has taken place. The steam should be used for one and a-half minutes at a temperature of 108° C.; the inner surface of the uterus for 13 mm. deep is turned brown, under this the tissue is bright red, and the underlying muscle is unchanged. The results are not to be judged by the depth of the burn, but by the histological changes produced, which depend on the thickness of the mucosa. If it is thin and atrophic, as in metritis of the old, it will be entirely destroyed. If it is hypertrophic the surface only is affected and the tissues become regenerated in a short time. In young persons, in whom menstruation is to be preserved, vaporization is absolutely contraindicated. For menorrhagia and metrorrhagia of the menopause it is most useful. Curetting fails in many such cases to do any good, but vaporization used a week after the curettage gives good results. The two operations can be done at one sitting when desired. Immediately after curettage it is necessary to use an anesthetic for vaporization on account of pain, but a week later it can be done without pain. In fifteen cases of women 40 to 55 years of age vaporization has been done without any bad results. In ten of them the menopause was brought about by obliteration after vaporization. It is both easier and less dangerous than total extirpation. At first it was thought that this method would be of value to stop the bleeding in myomata; but the author believes that it is contraindicated in all forms of myomata, both because the surface of the uterus is so uneven that the effect is nil, and because in some cases it has produced a rapid necrosis of the tumor, with gangrene. It has been attempted to sterilize the uterus in putrid abortion, gonorrhea, etc. This is futile because even if the surface mucosa were sterilized there would remain enough germs in the deeper layers to carry on the septic processes. Therefore all septic infections are a contraindication to vaporization.

Should the Ovaries Always Be Removed in Hysterectomy for Fibroma?—E. Rochard (*Bull. gén. de Thér.*, Feb. 8, 1906) considers that there is no advantage in leaving an ovary in the abdomen of a woman on whom a total extirpation of the uterus has been done. Dangers exist that counterbalance any advantages that may result from the presence of ovarian tissues in the abdomen. A second operation may have to be done to remove the remaining ovary, which has undergone degeneration;

it may become inflamed or cystic, or cause hemorrhage in the abdomen, or formation of a blood cyst. The author insists on completely removing the adnexa at the time of the uterine operation. He believes that the supposed internal secretion of the ovary is not of enough importance to be considered in such cases.

DISEASES OF CHILDREN.

Spirochetes in the New-Born.—Paul Salmon and Macé (*Bull. de la Soc. d'Obst. de Paris*, Nov. 16, 1905) describe the organs of a babe who died sixteen hours after birth, and who was infected with syphilis and covered with a pemphigus eruption. The spirilla were found in the bullæ and in the internal organs, suprarenal capsules, lungs, epithelium of the bronchi, spleen, etc. They were intracellular in the suprarenals and bronchi. Spirilla were, as usual in the new-born, very numerous. This frequency is a symptom of hereditary syphilis. In acquired cases the organisms are not nearly so abundant. It became necessary to separate the babe from its mother, and to have a wet nurse, who was charged not to nurse the child, but to feed it from a glass after milking the breast and to handle the child only with rubber gloves. In similar cases if a nurse can be secured who has been cured of syphilis and is immune she can nurse the babe without danger to herself. Spirochetes are constant in the bullæ of syphilitic pemphigus. One of the proofs that this germ is the origin of syphilis is its frequency in hereditary cases of this disease. In a macerated fetus no spirilla can be found, as the bacteria have been killed by a sort of autodigestion. Menetrier and Rubens-Duval (*La Presse Méd.*, Jan. 3, 1906) detail the case of a new-born infant, who died twelve hours after birth, in whom spirochetes were found. There were bullæ of pemphigus, but the internal organs showed no macroscopic or microscopic lesions of syphilis beyond congestion. The authors found spirochetes disseminated through all the organs. They were in the bullæ, in the derma, and the surrounding skin, and in the neighboring vessels, in the suprarenal capsules and the spleen. They were especially frequent about the vessels within them, and in their walls. In the suprarenal capsules they were in the glandular cells. The placenta contained them in the vessels of the fetal circulation in great numbers, while they were absent from those of the maternal circulation. This seems to have been a true septicemia from spirochetes arising from hereditary syphilis, in a new-born child which presented no lesions of the viscera except congestion.

Bacteriological Diagnosis of the Meningococcus of Weichselbaum.—Fr. Kalberlah (*Berl. klin. Woch.*, Nov. 27, 1905) says that the chemical, physical and cytological examinations of the cerebrospinal fluid all leave us in doubt of the diagnosis

of meningitis due to the meningococcus of Weichselbaum; only the finding of the germ itself makes the diagnosis quite certain, the meningococcus being the etiological factor in epidemic cerebrospinal meningitis and in most of the cases of sporadic nature. In many clinically clear cases the meningococcus is not found. The examination for the germ should be made very soon after the withdrawal of the fluid in order that we may be certain of its presence, as the meningococcus soon disappears. The author made very careful examinations after three separate punctures made in the same individual, the fluid being preserved in different ways. He found that keeping it on ice or at the temperature of the room causes the death of the germs, in the latter case after fourteen hours. In a puncture made on the seventh day of the disease the meningococcus had disappeared. It seemed necessary to examine the fluid as soon as possible after puncture, and to keep it at a high temperature until it is examined. The author recommends the preservation of the fluid in tubes of Loeffler serum without allowing it to cool below body temperature. It should also be examined within twelve to fourteen hours after puncture.

Cerebrospinal Meningitis.—Charles Boldnan and Harry E. Goodwin (*Med. News*, Dec. 30, 1905), besides giving a review of the literature, present a study of 58 instances of multiple cases in the same house (representing 144 cases) found in the records of the Department of Health of New York City. They say that the disease has occurred in several large epidemics during the past century; sporadic cases are met with in the periods between these epidemics and constitute the link between the epidemics.

We do not know the circumstances giving rise to these epidemic outbreaks. The epidemic form of cerebrospinal meningitis is almost invariably associated with the meningococcus of Weichselbaum; the sporadic cases are frequently associated with this organism. During the first week of the disease the meningococcus is present in the nasal mucus in full half of the cases; later in the disease it is found in a smaller fraction of cases. It also occurs in the nasal secretion of some persons who are in close contact with cases of cerebrospinal meningitis. In the writer's series this was about 10 per cent. of the persons examined. The meningococcus has a low vitality, being rapidly killed by drying and exposure to sunlight. This makes infection by dust extremely improbable. The disease seems distinctly communicable in the sense that the *organism is transmitted* from the nasal secretion of one person to another. The transmission of the organism, however, is not synonymous with *transmission of the disease*. The susceptibility of the individual is an important factor in the development of the disease. It seems unlikely that infection is frequently due to

trauma, or is the result of overexertion. Cerebrospinal meningitis in other animals seems to have no connection with the disease in man. The subject, however, has not been sufficiently worked out to admit of positive statements. There is not evidence to show that the disease is carried by vermin or insects. The disease in some epidemics affects mostly infants, in others, older children, and sometimes chiefly adults. The reason for this is not at all clear. The period of incubation seems to be short, from one to four days. There is no evidence of the occurrence of "dwelling infections."

Infection with Scarlet Fever Through Open Wounds.—Charles Hermann (*Arch. of Ped.*, Oct., 1905) records a case of scarlet fever in a child who had been exposed to other cases in the family for three weeks without contracting the disease. Two days after receiving a burn on the arm and leaving it unprotected the disease developed. The wound was covered with a dirty exudate; axillary lymph nodes were enlarged and tender; the rash appeared first near the wound; pharyngeal symptoms were slight. Another case occurring in a child with an uncovered vaccination wound is also described. The writer believes that extrabuccal infection with scarlet fever is probably more frequent than is supposed. It should be looked for in cases with unusually short incubation period, with slight throat symptoms, or when the rash first appears in an unusual situation. All children exposed to scarlatinal infection should have open wounds covered by a protective dressing. An individual who is immune to infection in the ordinary way may contract the disease by direct inoculation.

Restriction of Contagious Diseases in Cities.—Charles V. Chapin (*Amer. Med.*, Dec. 9, 1905) says that the success of isolation in restricting the infectious diseases will depend upon the completeness with which *all* the sources of infection can be controlled. If only a small proportion of the foci are known probably no effect will be produced. In such diseases as pneumonia and influenza there is reason to believe that the number of persons bearing the specific organisms is much greater than the number reckoned as sick. In these diseases it can hardly be hoped that restrictive measures will be effective. So, too, there is not the slightest ground for thinking that cerebrospinal meningitis, the specific cause of which is probably widespread, can be diminished by such means. If isolation and disinfection can accomplish anything it must be in smallpox, yet too much credit must not be given to them without allowing for the powerful influence of vaccination. In typhoid fever nothing is likely to be gained by isolation, but strict personal cleanliness is the point to be insisted upon. Children with measles are kept out of school for two or three weeks, as are usually other children in the family, but others may have been infected before recognition of the disease. Closure of the

lower school grades whenever 5 to 10 per cent. of the children are infected appears to be a wise procedure. The value of placarding is an open question. There is no evidence that restrictive measures have so far had any appreciable effect in checking the disease, and it is difficult to believe that more stringent measures would do so. Whooping-cough does not appear to have been at all affected by public health measures. It is true that these have not been strictly enforced, since diagnosis is difficult and frequently no physician is called, and the possibility of infecting others persists for a long and undetermined time. For these very reasons it is unlikely that restriction will accomplish much in limiting the disorder. Exclusion from school, the occasional closure of schools, and perhaps placarding, seem to be the only available measures. In many English cities as high as 80 or 90 per cent. of the recognized cases of scarlet fever have been removed to isolation hospitals, yet the disease is about as prevalent as ever in those cities and not less so than in cities without such hospitals. Everything points to the conclusion that scarlet fever spreads not from the recognized cases, but from those which are not. Four weeks is a good limit for the period of isolation; three might be as good. There is no means of determining the duration of infectiousness. The desquamation is no indication; the discharges from mucous surfaces are unreliable. It is probably necessary to exclude from school all children of the family. Wage earners should rarely be interfered with. Official disinfection had better be omitted entirely. People contract scarlet fever from chance contact with persons not known to be infected. We can never teach this and guard against it so long as by fumigation we encourage the notion that it is infected things that do the harm. In diphtheria, reasonable procedures for the present might be to placard all reported cases, keeping up isolation for four weeks, to exclude all children from school, to permit most wage-earners to work, to provide hospital accommodations for the very poor, to furnish free antitoxin and free bacteriological examinations. Official disinfection may well be abandoned. Unless at least two negative cultures are obtained from every member of the family it is a farce and encourages false ideas of the mode of transmission of the disease. Instead of trying to render isolation more complete in cases of the common contagious diseases, the effort should be made to reduce the restrictions to the lowest limit compatible with the object sought, the approximate prevention of extension from recognized cases.

Diphtheria Antitoxin.—B. F. Royer (*Medicine*, Jan.) says that in the Municipal Hospital, Philadelphia, it is customary to give antitoxin to each patient immediately after admission, the dose varying with the extent of involvement. If a single tonsil shows the exudate, 2,500 units are given; for both tonsils, 5,000 units; both tonsils with pillars or uvula, 5,000 to 7,500

units; both nares and pharynx or larynx, 7,500 to 10,000 units. Unless the membrane rapidly disappears the dose is repeated in from 12 to 24 hours, and then in the same or decreasing doses at 24-hour intervals. From 30,000 to 60,000 have been given and failed, but success is more common than with smaller doses. For immunization, 500 units is sufficient, if the exposure has been slight; 1,000, if there has been great exposure. With these doses no case of diphtheria has occurred in the hospital among 300 non-infected mothers or children admitted with their relatives.

Miles Arnold (*Med. Chron.*, Feb.) finds that perfusion of an isolated frog's heart with diphtheritic antitoxic serum without preservatives, but mixed with Ringer's solution, causes no depressing effect. When the serum containing the preservatives added to commercial antitoxins was used, there was a very marked depressing effect, much the same as that obtained from Ringer's fluid containing a corresponding amount of trikresol or carbolic acid, the preservatives most frequently used. This effect was so marked as to suggest that the preservatives cause depression in large doses, these sometimes containing four grains of pure carbolic acid.

Epidemic Parotitis and Pertussis.—Paolo Galli (*Riv. Clin. di Ped.*, Jan., 1906) calls attention to the observations published by Bernardone, relative to a possible antagonism between parotitis and pertussis when occurring at the same time in the same neighborhood. The author has observed an epidemic of parotitis occurring in Faenza, followed by one of pertussis, which shows evidence of this antagonism. In some districts where the pertussis appeared after the parotitis, the cases were very light and soon over, while in other districts, after the mumps had passed over the community, no epidemic of pertussis occurred, although it was general in the other districts. He believes that we cannot come to a definite conclusion as the conferring of immunity to one disease as a result of an attack of the other, until more observations have been made; but we can say that the parotitis has favorably affected the pertussis in some cases.

Tuberculosis.—A healthy child, 9 months of age, is reported by Dr. C. W. Townsend (*Arch. of Ped.*, Jan.) as being suddenly taken ill with vomiting and fever, which lasted over two months, and ended in death. Physical examination was persistently negative, except for a serous otitis at first. The autopsy showed extensive peritoneal tuberculosis, and a few shallow intestinal ulcers. The bacilli probably entered the tissue through these. The case is believed to furnish evidence of infection, transmitted through milk and suggests the possibility of the infection of man by the bovine tubercle bacillus.

Glandular Fever.—A. E. Vipond (*Arch. of Ped.*, Jan.) pleads for more definite recognition of glandular fever as an in-

fectious disease. It rarely occurs after 16 years of age. It begins with symptoms of a general infection such as influenza with development of stiffness, tenderness and pain in the neck, and enlargement of the lymph nodes of the neck without inflammation of the pharynx or tonsils, and of the axillary and inguinal nodes. The temperature remains high for three to seven days, with morning remissions, and often ends by crisis. Resolution of the enlarged lymph-nodes requires fourteen to twenty-one days.

Acute Yellow Atrophy of the Liver.—A. H. Wentworth (*Arch. of Ped.*, Feb.) records a case of this affection in a boy five years of age, with typical symptoms and course. The disease was not suspected during life, so the urine was not examined for leucin and tyrosin. Physical examination during life showed the liver to be increased in size. It was palpable during the last stage the disease. In spite of the normal or slightly increased size the liver cells were destroyed in at least three-quarters of the organ. The spleen was very much larger than normal, but was adherent to the diaphragm in such a position that it could not be palpated.

Infantile Cerebral Paralysis, Post-Scarlatinal.—Salvatore Pastore (*Gior. Inter. d. Sci. Med.*, Feb. 15, 1906) discusses the occurrence of cerebral paralysis of infectious nature following scarlatina, measles, erysipelas and other germ diseases, in connection with a case that came on after scarlatina, and which strongly resembled in its results anterior poliomyelitis. The patient was attacked by scarlet fever at the age of six years, and about the thirtieth day of the illness it was found that the whole left side was paralyzed, with facial paralysis and aphasia. The lower extremity recovered entirely, but the upper extremity remained powerless, became atrophied, and showed athetoid movements, contracture and normal electrical reaction. There were manifestations of irritation of the motor area, but no epileptiform convulsions: cerebration was slow. The patient at first sight seemed to have had a monoplegia, but the history contradicted this idea. Had there been a poliomyelitis the leg would probably have been more affected than the arm. In spinal paralysis hemiplegia is rare, as is paraplegia in cerebral paralysis, while hemiplegia is the most frequent form in polioencephalitis. In poliomyelitis anterior the reflexes are abolished by the interference with the spinal reflex arc, while in this case the reflexes were exaggerated. Spastic paralysis and normal electrical reaction go to show that this was a cerebral paralysis, as does the hemiathetosis. In encephalitis contractures appear early. Thrombosis and hemorrhage produce flaccid paralysis, and the course of the disease is different, improvement beginning early, while the condition is aggravated for some time in encephalitis. The obstetrical paralyses are distinguished by absence of fever and convulsions. Various forms of microbes may produce cerebral lesions with alterations of the vessels and the paren-

chyma: such are the bacillus coli, typhoid bacillus, staphylococcus and pneumococcus. The lesions are produced by the toxins generated by the bacilli. Acute ascending paralysis, infantile paralysis and acute spinal paralysis may all be caused in this way. Such infections are epidemic, as well as those following children's diseases. Diffuse myelitis is observed in the course of pneumonia and typhoid, diphtheria and scarlatina. Of 2,213 cases of scarlatina observed by Roger only four showed incomplete paralysis, so that this seems to be rare. Any of the organs may be attacked by the scarlatinal poison. This case seems to be unique among reported cases: it adds to the literature of spastic paralysis as being clearly produced by an infective agent, and the completeness of the history renders it valuable.

Spinal Amyotrophy in Children.—Luigi Concetti (*Riv. di Clin. Ped.*, Jan.) describes amyotrophy as primary or secondary, according as the lesions arise during the embryological period, or after birth. When primary the lesion includes muscles that are developed at about the same period of embryonic life, and the cause acts on cells of the mesoderm which become differentiated to the voluntary muscles: these muscles are formed, but later undergo atrophy and disintegration, not assimilating sufficient nutritive material. Secondary amyotrophy involves usually the muscles of the extremities, and extends from the periphery to the center: it involves the peripheral nerves, anterior roots and cervical and lumbar enlargements. The cause is some form of toxemia, often infectious in nature. These secondary conditions come on in later childhood, after the fourth year; there are fibrillary twitchings, reaction of degeneration and changes in sensibility. Pathological lesions involve the anterior gray columns of the cord and peripheral nerves. Among these are Duchenne's paralysis, beginning in the small muscles of the hands; Déjerine's symmetrical atrophy of the lower extremities; and Charcot's atrophy of the lower leg and foot. The prognosis in children is worse than in adults in the rapid progress of the disease and its extension. Treatment should include absolute rest, good nutrition and hygiene, the use of medication containing phosphorus, tepid electric baths, and moderate massage. When this treatment is begun before the nerve lesions have become confirmed we may anticipate better results than have heretofore been obtained.

Friedreich's Ataxia.—Wharton Sinkler (*New York Med. Jour.*, Jan. 13) gives the histories of thirteen cases of Friedreich's ataxia which have come under his personal observation. Three were in one family, three in another, and two in a third, so that the thirteen cases occurred in eight families. In addition to these, one of the patients had a brother who also had Friedreich's disease. There were seven males and six females. The age of onset varied considerably. The youngest patient in which the early symptoms were observed was two years old. There were two at three years, two at five, one at seven, one at eight, one at

eleven, two at eighteen and one at twenty-one, and in one instance it was stated that the child had never walked normally. The knee jerk was absent in nine, present in two, and exaggerated in two; the plantar reflex was absent in five and present in eight; contractures of the feet and limbs were present in seven patients; the speech was affected either in the way of slurring and scanning or indistinctness in seven patients, and in six it was not disturbed; nystagmus was present in nine patients and absent in four. In one family, in which the cases were followed to the termination, all three patients died of pulmonary consumption, two at the age of 26 and one at the age of 24. In this family there is now a third generation in which are three children, all perfectly normal. In the families in which there were two or more cases, the type of the disease was the same in each instance.

Nervous Lesions Occurring with Tubercular Cavities in Infants.—L. Lortat-Jacob and G. Vitry (*La Presse Méd.*, Jan. 13, 1906) tell us that the researches of Landouzy have shown that tuberculosis is frequent in early life, but that the infants usually die before the anatomical lesions have reached the stage of producing caseous glands. Cavities in the lungs are rare, but they are known to occur in some cases. This rarity of cavities is explained by the very different evolution of the disease in the baby from that in the adult. The progress is generally rapid and generalization of the lesions occurs early: the early economy is invaded, most often by way of the lymphatic vessels. Hence the cheesy form is rare. Compression of the pneumogastric nerve with changed innervation of the pulmonary area is an important factor in the development of cavities. The authors examined the body of an infant who died in the nursery of the Hôpital Laennec at the age of three months. There had been no sign of pulmonary trouble noted by stethoscopic examination, nor any generalized tubercular trouble. The death resulted from malnutrition and diarrhea. The autopsy showed in the upper lobe of the right lung an induration containing a cavity the size of a pea, filled with caseous pus. The tissue about it was infiltrated with tubercular tissue of recent origin. In the posterior mediastinum there was a tubercular lymph node the size of a lentil, intimately adherent to the posterior surface of the pneumogastric nerve on the right side; it was one of the intertracheobronchial nodes, and some of the others were enlarged. The spleen was increased in size and contained tubercular graulations; liver and kidneys showed the same condition: the intestine was normal, but there were many enlarged mesenteric glands, some of which were caseous; meninges normal. The spleen, liver and kidneys contained tubercle bacilli. The pneumogastric nerve near the tubercular node showed a thick sheath of sclerotic tissue. The nerve fibres were degenerated and lymphatic cells were found between them. The bacilli were numerous in the lymph node, but were not found in the nerve. The invasion was probably by way of the lymphatics. Cutting

the pneumogastric nerve in rabbits has shown that these animals quickly become tuberculous when exposed to contagion, while normal rabbits remain well in the same environment. The authors consider that the compression of the pneumogastric nerve in this patient was an important factor in the involvement of the lung.

Intoxication Arising from Drugs in Infants.—R. Jemma (*Riv. di Clin. Ped.*, Dec., 1905) says that although some children show a remarkable tolerance for certain drugs others suffer from symptoms of intoxication from the use of therapeutic doses of medicines ordinarily harmless. On one side series of cases may be found to demonstrate the harmfulness of opiates in babies, reciting cases of death from moderate doses, while other authors give long series of children who took without harm quite large and repeated doses of opiates, seeming to establish a tolerance for the drug. The author believes that the explanation of this apparent contradiction lies in the individual idiosyncrasy of the child.

Milk and Scarletina.—Alice Hamilton (*Amer. Jour. Med. Sci.*, Nov., 1905) reviews the literature of this subject, showing that the English are practically the only adherents of the theory that scarlet fever is a disease of cattle and can be conveyed from them to human beings. She believes that the literature of milk-borne epidemics of scarlet fever contains many based on insufficient evidence as to the agency of milk in the dissemination of the disease or based on the belief that a disease in cows is capable of causing scarlet fever in man. The disease in cows supposedly responsible for scarlet fever in man is ordinary cowpox, and the disease in man supposed to be caused by it is either septic fever from infection with pyogenic organisms or coincident scarlet fever. There is no good evidence that milk from diseased cows can cause scarlet fever in man. There are a fair number of reports of scarlatinal outbreaks which apparently prove that milk is a good culture medium for the scarlet fever virus and is the most frequent agent of indirect infection with this disease.

Icterus as a Complication of Scarlet Fever.—Oskar Cross (*Munch. med. Woch.*, Nov. 28, 1905) says that icterus is a rare complication of cases of scarlet fever of moderate severity, and disappears in the course of a few days. When complicated with nephritis Baginsky considers it of bad omen, especially when it is of septic origin. In slight cases the prognosis is not rendered unfavorable by this complication, which indicates a certain degree of duodenal catarrh. The author records two cases observed by him, both of them in adults, who underwent slight attacks of scarlet fever. The icterus was slight and transitory, and both cases went on to a good recovery. The physician must carefully distinguish between these slight cases and those in which sepsis produces an acute fatty degeneration of the liver.

Congenital Laryngeal Stridor.—Henry Koplik (*Arch. of Ped.*,

Dec., 1905) records the history and autopsy findings of a case of congenital laryngeal stridor. In view of the fact that in the successive autopsies of three other writers as well as in his own case anatomical anomalies of the epiglottis and larynx were found, he believes that enlargement of the thymus has little to do with the condition under consideration, and that the term thymic asthma should be held in abeyance until the pathology of the affection is proven. A thymus weighing as much as thirty grams may be found in children dying from very different causes.

Sclerema Neonatorum.—A case of this affection is reported by J. P. C. Griffith (*Arch. of Ped.*, Feb.). The mother died, eleven days after labor, of tuberculosis or sepsis. The child was born at term and fed on condensed milk. At eight days the skin of the hips were said to have become hard. This extended to the legs and back. When seen at two months of age the cutaneous induration involved the upper portion of each arm, the back down to the mid-dorsal region, the nates, the outer and posterior portions of more than the upper half of the thighs, and small areas in the calves. Modified milk, massage and application of heat were ordered. Three months later recovery was practically complete.

Severe Hemorrhage in the New-Born.—Cathala and Lequeux (*Bull. de la Soc. d' Obst. de Paris*, Dec. 21, 1905) describes a very unusual case of severe hemorrhages taking place in a new-born child at the end of the first month of life. The infant was a twin and the other twin remained perfectly healthy. Such hemorrhages generally occur before the sixth day of life. The author states that they are the result of intoxication beginning in the gastrointestinal canal, or caused by syphilis or other microbic infection, which becomes generalized and produces changes in the blood, causing hemorrhages into the internal organs as well as from nose, eyes, etc. The intestinal infection may be streptococcic or with the bacillus coli. In this case the streptococcus was found in the blood of the heart. The child had a slight gastro-intestinal trouble, and an enema caused the infective material to enter the blood vessels and so become generalized.

Acute Leukemia.—The rapid course which this disease occasionally presents is shown by a case reported by A. D. Blackader and B. D. Gillies (*Arch. of Ped.*, Dec., 1905). The patient, a boy of 15, died just ten and a-half days after the onset of profuse epistaxis, the first of the severe hemorrhagic manifestations.

THE AMERICAN JOURNAL OF OBSTETRICS

AND

DISEASES OF WOMEN AND CHILDREN.

VOL. LIII.

JUNE, 1906.

NO. 6

ORIGINAL COMMUNICATIONS.

THE ETIOLOGY OF PUERPERAL SEPSIS.*

BY

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THIS part of the subject of the evening, which has been assigned to me, belongs more properly to the sphere of the bacteriologist. No additional advantage, however, can be gained by another report of a series of investigations. Medical literature already contains numerous and extensive bacteriological results.

I will present for discussion some of the points of practical significance which a paper with the above title calls for. To-day the nature of puerperal infection is thoroughly understood, and the only questions for dispute arise in the microflora of the genital canal of the pregnant woman and their relation to so-called autoinfection. Even these questions are about settled in the minds of most of the modern investigators.

In 1843, the first to offer plausible suggestions in regard to the cause of puerperal fever, was our own countryman, Oliver Wendell Holmes. With too little credit to themselves until recently, have the medical profession and humanity at large discharged their debt of gratitude to him. In his

■ *Read before the New York Obstetrical Society, March 13, 1906.

article on the contagiousness of puerperal fever, written so long ago, he reveals to mankind the first ray of light on the nature of this dreadful disease. Furthermore, this ray was a bright and a fairly complete one. To-day, with the addition of a few words on the bacteriology of puerperal fever and the necessary antiseptics in its management, his rules would be good ones for all accoucheurs to follow.

No less worthy of our praise and esteem is Semmelweis, of Vienna, often called the father of antiseptic midwifery, who, in 1861, demonstrated that most of the cases of puerperal sepsis were due to infection introduced in the genital tract from without, and thus showed that most cases were avoidable. He put his theories into practice, for, by the use of chlorine water for the disinfection of the hands of the students, the mortality from sepsis in the Vienna Maternity was reduced from 11.4 per cent. to 1.2 per cent. Both of these pioneers in proclaiming the nature of childbed fever met at the time such opposition from those in the highest ranks of the medical profession as to make us of to-day profoundly ashamed. Their ideas now are the established facts of the medical world. Yet little attention was given to the cause of puerperal fever until the discoveries of Lister, Pasteur and others identified the relation between bacteria and wound contamination. The idea that puerperal fever was a disease by itself was then abandoned and the doctrine was accepted that this complication of labor was identical with wound infection in other parts of the body and was caused by the same microorganisms, the only difference being that the pathological processes were modified by the peculiar anatomical relations of the genital canal.

There is no doubt that almost all cases of puerperal infection originate from without; that is, bacteria are introduced into the vagina by dirty hands, instruments, or dressings, so that the disease is almost always a preventable affection. This is proven by the immense reduction of the maternal mortality in hospitals by the application of antiseptic and aseptic methods to obstetrics. Nowadays this mortality in hospitals is a fraction of 1 per cent. In 13,000 cases at the Sloane Maternity Hospital, from September 26, 1893, to January 14, 1905, there were 32 deaths from sepsis, a mortality of .25 per cent. Of these cases 14 were neglected and maltreated outside of the hospital, so that infection undoubtedly took place

before admission. Two other cases ran an antepartum temperature and developed post-partum abscesses of the uterine wall. Three, in addition, became septic from an old tubal or ovarian abscess and another from a suppurating fibroid, thus leaving 12 cases, a mortality of .1 per cent., in which infection took place under the most approved hospital routine. Of these 12 cases, two were wound infections elsewhere; one in a case of Cesarean section, and the other in a case of symphyseotomy. In one a difficult and prolonged craniotomy, and in another a retained placenta with a severe postpartum hemorrhage, predisposed to the infection. Three of the cases developed insanity coincident with the sepsis; two cases developed a septic peritonitis following a curettage. In the other three cases, although one died from a pure streptococcus infection, the predisposing causes for the sepsis or the errors in technique were unknown. Other hospitals, with no emergency services and with smaller series of cases, report similar and even better results in more recent years. In these 13,000 cases mentioned above, at the Sloane Maternity Hospital, there were 1,184 cases indexed under the heading of puerperal infection, a morbidity of 9.1 per cent. As no bacteriological examination was made by routine in other cases which developed temperature otherwise diagnosticated, the morbidity from infection was probably higher. Edgar, in 2,200 cases, gives a morbidity of 13.58 per cent. In the Manchester Maternity the figures are 11 per cent. Zweifel, in the Leipsig Maternity, gives the large total of 33 per cent. morbidity. At any rate, as suggested by Lea, the morbidity in hospitals, taking 100.6° F. as our criterion, will average between 10 and 15 per cent. So we see, under the best surroundings in hospitals, although the number of deaths from infection is reduced to a vanishing point, the patients progress by no means smoothly to convalescence, and the morbidity is still too high. Our first problem is to reduce this morbidity, which is not an easy task, for so many cases are admitted to the hospital already examined and infected by outside manipulation. Our efforts should be directed at all times to a perfect aseptic and antiseptic technique.

In private practice the results are just the reverse. The frequency of severe cases of childbed fever and the mortality rate has been little diminished since the introduction of Listerian methods. Wiggin, Boxall, Byers, Webster, Williams, Norris, and others state that there has been no change. Pryor even

believed that there were more deaths from puerperal infection to-day than before the introduction of aseptic precautions in the management of labor. The statement of the former men is borne out by a study of the vital statistics in the large cities. These figures in truth are not entirely reliable, but the errors contained therein will diminish the percentage of maternal deaths from sepsis, for the certificates of women dying during the puerperium are often made out with an incorrect diagnosis, such as typhoid fever, malaria, grip, pneumonia, endocarditis, meningitis, etc., when in fact the cause of death was puerperal infection. This high mortality from sepsis in private practice constitutes a reproach on the practitioners of medicine everywhere. Norris tabulates three causes for this continued high death rate:

(1) The carelessness and ignorance of the midwife who attends more than 60 per cent. of women in confinement in the large cities.

(2) The uncleanness of the rank and file of the profession.

(3) The fact that the earliest symptoms of infection are disregarded and are not promptly treated. All of which is very true. We have then a second great problem before us; *i. e.*, to diminish the mortality in private practice.

To solve it a better education in surgical cleanliness for midwives and students is necessary as well as a continual warfare against the slovenly methods still in vogue by many of the older and careless members of the profession. When we see and hear what these men do in a confinement case it is very surprising that the number of infected cases is not greater than it really is. Nature fortunately provides strong means for the patient's protection, for often, without doubt, pathogenic germs are introduced into the genital canal which fail to cause trouble. Just as many students and physicians who cut themselves while dissecting or doing autopsies are not infected, so the natural resistance of the pregnant woman is great. The physiological increase in metabolism during pregnancy, with the accompanying increment in the capacity for assimilation and excretion, purifies the blood, which by virtue of its leucocytes, phagocytes, alexins, and the various adaptive or immune substances, is in turn better fitted for the rapid elimination of many infectious agents, especially those of only moderate virulence, before they become adapted to unfavorable conditions in the vagina or elsewhere, and acquire higher grades of virulence. Nature

provides other means of resistance. The mucus plug in the cervix hinders the development in the cervix of the germs present in the vagina. The intact bag of waters prevents a bacterial invasion from the cervix, while the genital canal, during labor, is douched and flushed from above downwards, by a fluid, in some degree bactericidal, the liquor amnii, and by the passage of the child, placenta, and the uterine blood. Finally a firmly contracted uterus closes the uterine sinuses. Thus it is that the body tissues in most instances are adequately safeguarded against infection, even when pathogenic bacteria are introduced into the vagina from without.

What are the microorganisms which cause puerperal infection? It is now absolutely known that the streptococcus is the most common and fatal germ detected. Many varieties of aerobic, and also of anaerobic streptococci, at present bacteriologically indeterminate, doubtless exist, and exhibit all grades of virulence. Aerobic, and possibly, as suggested by Veillon, other anaerobic forms may be present in the vagina or uterus without symptoms or they may incite only mild infections. This microorganism may simply attack the vagina or the cervix alone, but commonly the uterus is involved. It may grow locally and superficially, setting up a toxemia, may rapidly invade the uterine wall by the lymphatics, or may enter the blood, causing a bacteriemia or pyemia. Frequently the streptococcus is associated with other pathogenic germs—a mixed infection, which may increase the severity of the disease.

Mayrhofer was the first to detect chains of streptococci in the genital organs of women dying of puerperal fever. Many others soon substantiated his findings. Pasteur, in 1880, was the first to cultivate the streptococcus from the blood of a woman dead of puerperal infection. Similar results were obtained by Doléris, Lomer, Winckler, Bumm, Winter, Döderlein, Widal, and others. At first it was thought that the streptococcus was the sole cause of puerperal fever, for Widal found this organism in nearly every fatal case in which he did an autopsy. The lesions he noted were various—vaginal ulcers, endometritis, parametritis, peritonitis, pyemia, and crural phlebitis, all due to this germ. At the Sloane Maternity Hospital, in 13,000 deliveries, all but four of the fatal cases from sepsis, in which bacteriological examinations were made, showed streptococci. Franz found streptococci in 80 per cent. of severe cases of in-

fection. Czernewski found streptococci in 49 out of 91 cases of puerperal fever of varying severity. Krönig found them in 75 out of 179, Williams in 44 out of 150 cases, Vogel in 7 out of 54 cases, Foulerton and Bonney in 35 out of 54 cases, 25 of which were mixed infections. Although all had agreed as to the frequency of streptococci in the uterus of puerperal fever, these results show that various other germs must be held accountable.

Brieger, in 1888, proved that the staphylococci may cause fatal puerperal infection. Doléris, Döderlein, Fehling, Hägler, Williams, and many others have found this germ. It rarely develops by itself, and is generally the cause of mild types of the disease which are more frequently locally limited. Strücnmann, on the other hand, from his own experiences and from the findings of other observers, believed that staphylococcus infection occurs frequently and often causes a fatal outcome. This germ however, is constantly found associated with other organisms.

The colon bacillus was first definitely recognized in pure culture from a case of puerperal fever in 1893 by von Franqué. It has since been found by Gebhard, Bar and Tissier, Rendu, Winckler, Marmorek, Williams, Wadsworth and many others. It is easy to see how this microorganism can gain admission to the vagina, when one considers the proximity of the vulvar orifice to the anus, rectum, and perineum. The hands of the obstetrician, even when gloved, are only too frequently soiled by feces during delivery. The extension of the colon bacillus has not been satisfactorily determined. With poor resistance on the part of the patient, associated with streptococci or other germs, it can often incite a malignant process.

Krönig, in 1893, isolated the gonococcus in 9 cases of puerperal fever.

A large percentage of pregnant women have gonorrhea, and the changes in and about the parturient canal during and after labor have been shown by Noeggerath and others to start up a latent process. Leopold estimates that 20 per cent. of pregnant women have gonorrhea. Noeggerath, Sānger, Burckhardt, Oppenheimer, Lomer, and von Steinbuckel place their figures between 18 and 30 per cent. Krönig, in a later series of cases found the gonococcus in 50 out of 179 cases of puerperal fever. Taussig found the gonococcus in 17 per cent. of his cases, Bumm in 12 out of 166 cases, Vogel in 4 out of 24 cases, Stone and

McDonald in 17 out of 53 cases, Williams in only 8 out of 150 cases, while Foulerton and Bonney obtained no gonococci from the uterine lochia of 54 cases of puerperal fever. These last observers claim that undue prominence has been given to the micrococcus of Neisser in the etiology of puerperal infection. The course of this form of infection is usually mild. The gonococcus, as is well known, is extremely well adapted to develop in certain mucous membranes, notably those of the urethra, cervix, and uterus; but in the subcutaneous tissues the conditions are unfavorable. However, general infection may occur, and although the course of such infections is at first subacute, they may prove serious in the end. Jardine reports a severe case of gonorrheal endocarditis and rheumatism following delivery. Occasionally a fatal result follows. At the Sloane Hospital we have recently had a death due to the gonococcus in pure culture. Halle, and also Dabney and Harris, report fatal cases. The latter obtained pure cultures of gonococci from the cardiac valves.

The gonococcus, as shown by Wassermann, is aerobic and cannot live long in a closed sac. It is usually a parasite of the mucosa and extends by continuity of mucous membrane as maintained by Wadsworth and Stone. It seldom develops in the deeper tissues, but by starting inflammations in the mucous membranes renders them more suitable for the entrance of other pyogenic cocci. The effects of the gonococcus are detected for long periods after labor in enlarged tubes and pelvic peritonitis. A one-child sterility is another common sequela.

Bumm, Nisot, Williams, have reported cases of puerperal fever due to the Klebs-Loeffler bacillus. At the New York Foundling Hospital years ago there were cases of diphtheria of the genital tract which undoubtedly developed because the resident at that time was in charge of both the contagious and maternity wards. These cases should yield promptly to antitoxin.

The pneumococcus is rarely the causative agent of puerperal fever. Schuhl, Czemetshka, Weichselbaum, and McDonald each report a case. Foulerton and Bonney cite six cases, concluding that the degree of the infection is a mild one. Williams and Dobbin isolated the bacillus typhosus from the uterine lochia in a case of puerperal fever. Kühnau and Blumer also report similar cases. The uterine infection may have been secondary. It is a question whether these cases were not simply straight cases of typhoid fever.

Heyse and Rubeska in fatal cases of tetanus detected the tetanus bacillus in the uterine lochia after labor.

Another group of microorganisms associated with puerperal fever is the bacillus aerogenes capsulatus of Welch and Nuttall. This gas-producing germ inhabits the intestine, and also the normal vagina, and in its relation to puerperal fever simulates the colon bacillus. Cases have been reported by Doléris, Krönig, Ernst, Stewart and Baldwin, Dobbin, Little and Wadsworth. In several cases at the Sloane Hospital this microorganism has been found at autopsy.

That infection from anaerobic saprophytes is possible is well known, but as special technique is required for the cultivation of these bacteria they are not often isolated in routine bacteriological examinations. In their growth a general toxemia results. They can infect the amniotic fluid before delivery, as shown by Hallendal, but usually grow after delivery in bits of placenta, membranes, decidua and clots left behind in the uterus. These germs can grow in parts of the uterus, cervix, and vagina necrosed by pressure during delivery causing gangrene. Fibroids with inadequate blood supply often slough and afford especially favorable conditions for the development of these bacteria. They may also flourish in a retained lochia. Many of the rises in temperature occurring late in the puerperium are to be attributed to the presence of these saprophytic bacteria. Their presence is usually manifested by odor. When the dead material is removed from the uterus and vagina all symptoms promptly cease. However, it is very evident that many cases diagnosticated clinically as "sapremia" cannot be proven as such unless a bacteriological examination of the uterine lochia is made. Bumm and von Franquë have shown that in many instances the fever was caused by streptococci, while Stone and McDonald have demonstrated that late rises are often due to the gonococcus.

What are the conditions which predispose to the growth of pathogenic germs in the genital tract? A dry labor, a long protracted labor, an instrumental delivery, whether by forceps, version, craniotomy, symphyseotomy, or Cesarean section all increase the chances for fever.

An induced labor, the introduction of bags into the cervix, manual dilatation of the cervix, many vaginal examinations predispose to infection. The retention of membranes, placenta, decidua, blood clots, are good culture media for the growth of germs.

Abrasions and tears of the perineum, vagina, cervix and lower uterine segment may be portals of entry and afford favorable conditions for the development of virulent bacteria.

Large hemorrhages, whether from separation of a normal placenta, from placenta previa, or from post-partum hemorrhage as well as primary anemia, tuberculosis, syphilis, and especially the toxemia occurring during pregnancy, so diminish the resistance of the patient that a few germs, or germs of low vitality and virulence can be the source of a severe and even fatal infection.

Finally a soft flabby uterus involuting slowly affords especially favorable conditions for the bacteria to enter the uterine wall, while the retention of lochia by a stenosis of the cervix is frequently the cause of a "sapremia."

When can germs enter the genital canal and cause puerperal infection? Either before, during, or after labor.

How do microorganisms get into the genital canal? Almost always by the hands of the accoucheur, midwife, or nurse, or by dirty instruments, *i. e.*, from without. Many physicians as not only careless, but also take too many risks in doing obstetrics. Anyone operating upon and dressing pus wounds, anyone attending contagious diseases, a physician with a chronic eczema, a pink eye, a coryza, one with infected abrasions or cuts on his fingers or hands, should preferably turn this branch of his work over to someone else, temporarily at least. If this cannot be done, the most minute antiseptic precautions with the use of rubber gloves must be exercised in order to avoid any possibility of infecting his confinement cases. So also the nurse must be free from any suspicion that she might be the means of conveying sepsis to her patient. I know of one case which was undoubtedly fatally contaminated by the nurse, who had an infected finger and had hidden the affection from the doctor in charge. The patient herself can be the source of infection. She can inoculate the vagina by making a digital examination, or by allowing intercourse just before the time for her confinement. The site of the greatest danger and to which source can be traced the largest number of infected cases after labor is the vulvar orifice with the perineum and anus in close proximity. In a bacteriological examination of the vulvæ of 30 cases, Edgar found pyogenic germs in 11 cases—40 per cent. These parts are with great difficulty thoroughly cleansed. The nurse only too often does this work incom-

pletely. She is unwilling to scrub hard enough. Dirty smegma between the labia minora and majora will often escape her notice. Besides no vulvar orifice is absolutely sterile without shaving. In private practice shaving will not be permitted. In the hospital this precaution should be taken, but when the skin is cut by the razor more harm than good has been done. At the Sloane Hospital a safety razor is being used with good results. One can easily see how germs at the vulvar orifice can be pushed into the vagina unless the most extreme care is taken in making a digital examination. Foul air as an etiological factor for sepsis is to-day disregarded, except that in the arrangement of the delivery room we strive to reduce the dust contained therein to a minimum.

I have said that undoubtedly *almost all* cases of puerperal fever originate from without—heterogenetic.

Are any cases due to infection from pathogenic germs already in the genital tract? In other words, is the doctrine of autoinfection tenable? This question has had its champions pro and con since the time of Semmelweis. No one ought to doubt the possibility of autoinfection unless the secretions of the uterus, cervix, and vagina of non-pregnant and pregnant women, healthy or not healthy, can be proven sterile before, during, and after labor. On these points the question depends. The results of equally competent bacteriological investigators have been confusing and diametrically opposed.

I imagine that no one would disagree with the conclusions of Gönner, Döderlein, Winternitz and others, that the normal secretions of healthy non-pregnant and pregnant uteri are free from pathogenic microorganisms. Even though the results in the examinations of the healthy cervical contents are not so convincing, the same position should be held. This cavity contains mucus, which is supposed to be a barrier to the invasion of the uterus by microorganisms in the vagina. Stroganoff claims that this mucus possesses properties destructive to germs, while Walthard believes that in it the germs cannot multiply. The latter maintains that the microorganisms found in the cervical secretion by many observers were carried up from the vagina by the passage of the speculum.

On the question of the secretions of the healthy vagina, we have a still greater difference of opinion.

Kehrer, Karewski, Kaltenbach, Döderlein, 1887; Winter, Widal, Steffeck, Burckhardt, Burguburu, Williams, 1893;

Koblanck, Walthard, Wadsworth, Bumm, Foulerton and Bonney, and others, have found pathogenic germs in a fairly large percentage of apparently healthy vaginæ.

On the other hand, Gönner, Thomen, Samchen, Bensis, Bergholm, and others, claim, from the results of their investigations, that this healthy vaginal discharge is sterile. Most modern obstetricians agree that the investigations of Krönig, Menge, and Williams, in 1898, have settled the matter. These men have considered it proved that the first set of observers, who found pathogenic organisms in the vaginal discharge of healthy women, carried on their work with faulty technique, for in a large series of cases they found pathogenic germs in only a very few instances. The gonococcus which they found quite frequently they disregarded. There is no doubt that most healthy vaginæ are sterile, and even possess bactericidal powers. This is proven by Krönig, who found that streptococci and staphylococci were eliminated from the vagina within twenty-four hours after their injection. Whether this hostility is due to the lactic acid found in the vagina, claimed by Döderlein to have been produced by the growth of an anaerobic bacillus which he has isolated, whether it is due to the outward flow of the vaginal secretion, to lack of oxygen in the vagina, or to the action of the tissue juices as suggested by Krönig, whether this germicidal property is aided by the anatomical elements of the vagina, by leucocytosis and by phagocytosis, as believed by Menge, it is well known that nature has provided many means of defense in a healthy woman's vagina.

But not all women are healthy, nor are the secretions of uterus, cervix, and vagina always normal. In 1892 Döderlein first called attention to normal and pathological types of secretions in the vagina. In 195 cases he found only 55.3 per cent. normal. He even went so far as to claim that the character of these two types could be distinguished clinically. Krönig, Kottman, Walthard, Wadsworth, and others were not able to make these distinctions, for in many discharges apparently pathological, no organisms were found, and vice versa.

In a series of 50 antepartum cases at the Sloane Hospital, Wadsworth found the vaginal secretions sterile in only 2 cases. In 3 cases streptococci were present for a number of days; the longest known time was six weeks. In 1904 Bumm and Sigart found streptococci in the vaginal secretion in more than 38

per cent. of pregnant women examined; 20.4 per cent. of the cases in which these germs were detected before labor developed sepsis during the puerperium. In 1905 Foulerton and Bonney found bacteria in the cervical secretion in 16 out of 30 women with vaginal discharges. The microorganisms found were the streptococcus pyogenes aureus and albus, the gonococcus, the colon bacillus, and a diplococcus. Were there errors in technique in these so very recent investigations? Were these secretions normal? Were the vaginæ healthy?

Another aspect of the question, which has been suggested by Little, is that the possibility or impossibility of autoinfection rests on the proof or disproof that the uterine lochia in afebrile puerperal cases is free from pathogenic varieties of bacteria, but it is perhaps a more significant question whether bacteria, among them atypical, nonvirulent streptococci, present in the vagina, may not occasionally acquire virulence under the favorable conditions existing after delivery, and give rise to infection. This is at present indeterminate, owing largely to the difficulties in identifying the various streptococci, pathogenic and non-pathogenic. At the last meeting of this Society, Dr. Nicholson of Philadelphia gave a short résumé of this subject.

As early as 1865 Mayrhofer demonstrated that for the first four days of the puerperium the lochia was sterile in afebrile cases. In 1887 Döderlein concluded that under normal conditions the uterine lochia does not contain bacteria, as he found bacteria in the lochia of only 3 out of 27 cases examined. In 1888 Ott found the lochia of 9 afebrile cases sterile and Czerniewski obtained negative results in 56 out of 57 cases. In 1889 Thomen found the lochia sterile in 6 out of 9 normal puerperal women. This positive result he considered to be due to contamination. In 1893 von Franqué, on the other side, found bacteria in the lochia in 2 out of 10 afebrile cases. In one case the streptococcus and in another the gonococcus were detected. In 1895 Walther found the lochia sterile in 10 cases unexamined during labor. In 1898 Burchhardt obtained 11 positive results out of 14 cases in cultures taken on the eleventh and twelfth days of the puerperium. Krönig and Menge found bacteria in the lochia in 13 out of 63 cases. In 3 cases streptococci were detected. In 1899 Stähler-Winkler obtained positive results from the lochia of 20 out of 55 cases, but no streptococci were found. In 6 the cultures showed obligate anaerobes. In 1900

Döderlein and Winternitz detected streptococci in 5 instances and anaerobes in 25 instances in the lochia of 250 puerperal women. Franz, also in 1900, found bacteria in every one of 10 lochial discharges, but in only 1 was the streptococcus isolated. Vogel, in 1901, claimed that later in the puerperium the uterus was more apt to show bacteria. This assertion was based on the analyses of 15 cases on the fourth day and again later in the puerperium. Wormser had had similar results. Schauenstein, in 1901, in an examination of 100 cases, found the lochia sterile in only 36 per cent. Stoltz, in 1903, found the lochia sterile in 65 per cent. on the ninth day. In the same year Marx obtained positive results in only 2 out of 47 cases. In 1905, Foulerton and Bonner found the lochia sterile in a series of 12 cases.

Little, in an extensive article, appearing in the December number of the *AMERICAN JOURNAL OF OBSTETRICS* reports 50 cases in which the lochia was examined immediately after labor and on the third and seventh days. In 40 afebrile cases, the lochia was sterile in 92.5 per cent., 62.5 per cent., and 50 per cent. of the cases. Counting negative the gonorrheal cases, the figures were 95, 85, and 50 per cent. No streptococci were found. He explains the variations in the results of other observers mentioned above in three ways: (1) Examinations of patients at different periods of the puerperium; (2) variations in technique; (3) variations in classification. Hirst, in 1906, found the streptococcus in the vagina in 1 out of 10 afebrile cases.

It seems to me, with all this evidence of positive results in the bacteriological examinations of the uterine lochia, errors in technique cannot be held responsible for the detection of germs so frequently by so many investigators. We all know that in many febrile cases—where we are absolutely sure the patient has puerperal sepsis and subsequently dies—the uterine lochia has been reported negative. Hirst reports that the intrauterine cultures failed to show septic infection in 4 out of 9 cases. This has occasionally been our experience at the Sloane Hospital. The same lack of positive information from blood cultures is the verdict of most observers, although Hirst believes that when the work is done by a skilled specialist, the blood culture is absolutely reliable as a means of precision in diagnosis of septic cases.

It is very difficult for the clinician to reconcile all these conflicting bacteriological findings.

The only logical conclusion is to come back to our original statement that almost all cases of puerperal infection originate from without. We can agree with Krönig, Menge, and Williams, that the normal secretions of the healthy genital tract are sterile. But there are genital tracts which are not healthy, and there are secretions of the uterus, cervix, and vagina which are not normal. These terms normal and healthy are often too indefinite and too elastic in their definition. How many cases develop temperatures when boiled rubber gloves have been used and external parts thoroughly cleansed? How do germs enter in such cases? How are we to explain severe septic cases when no vaginal examinations have been made, if these secretions of the genital tract are bacteria free? Franz reports that in 457 labor cases which were not examined internally, 66 developed mild infections and 14 developed severe infections. Does not autoinfection enter into the etiology of such cases? Nor do I see why a latent gonorrhea is not a good example of self-infection. Is a woman healthy if she has gonorrhea? Are the secretions normal if they contain the micrococcus of Neisser? I grant that most cases of pure gonococcus infections are mild, but occasionally as cited previously in this article, severe and even fatal cases can occur. It may be a question of time since the germ was introduced into the vagina, as explained by Williams in discarding the gonococcus infections from the rôle of autoinfections, but so far as the physician is concerned, this variety of sepsis is autogenetic. The same can be said of infection following a pyosalpinx, ovarian abscesses, vulvovaginal abscesses, chancres, rectovaginal fistulæ, dermoid cysts, and necrosing fibroids. These are unquestionable examples of autoinfection, and it may also be suggested that bacteria from the rectal mucosa, in particular the colon bacillus, may be carried by the blood or lymphatics to the bruised and torn tissues of the genital tract in close proximity and there find conditions favorable for their development. The sloughing of a deep internal perineal tear without any external laceration and other serious infections may be explained in this way. It is well known that a pyelitis develops in a similar manner during pregnancy.

There is another source of infection which may be considered autogenetic. When there are foci of bacterial disease in some other part of the body coincident with labor and the puerperium, the genital tract and its contents may not escape. I had a

private case recently who developed a mastitis on the eighteenth day and subsequently infected some retained clots in the uterus. The germs were probably conveyed from the breast through the blood to the uterine cavity. Hallendel, by experiments on rabbits, has demonstrated that hematogenic infection of the ovum can occur. This method of infection may account for foul-smelling liquor amnii in an intact amniotic sac when no vaginal examinations have been made. Even Williams himself, one of the greatest opponents of the doctrine of autoinfection, admits that certain anaerobes existing in the vagina may be responsible for puerperal fever. There are many believers in self-infection who hesitate to admit and express their opinions. There are none to-day so rabid as Ahlfeld was years ago; but there are many who hold that autoinfection is more common than is generally credited. Among them are Jardine, Bumm, Swigert, McDonald, Magneaux, Labusquière, Hardy, Scollard, Lea, Gow, Charles, Franz, Hirst, Foulerton and Bonney, and others. The two last-named observers, in an article written in 1905, conclude that an impartial review of their results and those of other investigators should convince most obstetricians that the vagina and cervix do contain bacteria which are potential causes of puerperal fever. In other words, Foulerton and Bonney are diametrically opposed to the views of Krönig, Menge, and Williams. The doctrine of autoinfection I will admit is a poor one to teach, if we are to propagate a surgically clean conscience and aseptic hands; but the pendulum has swung so far the other way, that the obstetrician is often blamed and censured without mercy or reason by the laity and by other physicians when a case of infection has occurred in his practice. This is the highest type of injustice, for the handling of a case and the aseptic technique may have been irreproachable.

My conclusions are that the etiology of puerperal fever can be traced, in almost all cases, to external infection—imperfect technique; but that there are a few cases for which the medical attendants are in no way responsible and must be attributed to so-called autoinfection.

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THE PATHOLOGY OF PUERPERAL INFECTION.*

BY

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THE pathology of puerperal infection is a subject that, followed to its termination, may lead us far from the point of initial infection, the pelvic organs.

The primarily infected point is usually in that wound which exists in every parturient woman, namely, the area of former placental attachment. From this point infection may spread by lymphatics, veins or mucous membrane continuity. Other uterine possibilities for entering infection exist when the uterine tissue has suffered trauma, as in partial or complete rupture, in deep cervical lacerations, or in the Cesarean section wound; or when the vitality of parts of the uterus has suffered from prolonged pressure, or as in the case of some fibroids, from diminished blood supply. In the vagina, lacerations or necrosis from pressure give entrance for infection, especially in case of lacerations of the perineum.

Rarely labor completes a pathological process by the rupture or partial emptying of a quiescent pus sac, during uterine contractions.

In cases of primary vaginal infection the secondary involvement of the uterus may obscure the initial infection.

From a small exudate-covered wound which granulates to recovery, there may be found the extreme of a vagina showing either general inflammation or areas of slough which perhaps communicate with bladder, rectum, or peritoneal cavity.

Direct lymphatic extension may cause pelvic cellulitis, or abscess. Mucous membrane extension from the vagina may infect the endometrium, but the order of involvement is more apt to be the reverse.

An infected endometritis depends for its pathological manifestations on the virulence or variety of the germ and amount of resistance in the tissues called forth by the poison. Thus in the most rapidly fatal cases, autopsies have shown the uterus with the endometrium practically undisturbed, but through which

*Read before the New York Obstetrical Society, March 13, 1906.

the streptococci have rapidly passed by lymphatic channels to focalize in a general peritonitis. On the other hand, in slower cases, we find the uterus lined with thick necrotic tissue, with gangrene extending into the musculature, its remaining walls pocketed with multiple small abscesses.

The advancing infection is checked and localized by the massing of leucocytes above the area of involvement. So probably most of the cases of puerperal infection which proceed to a favorable termination consist of little more than an acute purulent endometritis, which may be more marked over the area of placental detachment. Here exudate, necrotic tissue and granulations occur, and by the removal or natural exfoliation of the infected material a cure is accomplished. This process has meanwhile involved by secondary infection any unrepaired laceration of cervix, vagina or vulva.

Extension of infection is lymphatic, venous, or by continuity, probably in the order named as to frequency.

Lymphatic progress of the speedier sort leads promptly to general peritonitis. In slower cases the line of infection may be demonstrated along the lymphatics which surround the pelvic veins, causing a periphlebitis which may result in surrounding the veins by a sac of pus. A more remote periphlebitis is often seen at the inguinal canal or about the large femoral vessels.

Following the infected lymphatics small abscesses, as a rule more numerous near the peritoneal surface, are found, or the infection may localize from the lymphatics into a phlegmon of the cellular tissue of the broad ligaments, eventuating in abscess. In other cases the tubes or ovaries receive the infection by way of the lymphatics.

Venous infection progresses by involvement of the thrombosed venous sinuses of the uterus at the placental site. Infection, then, proceeds along the pelvic veins, causing more extensive thrombosis, then softening the clot and passing on into the circulation. From this condition come the many remote manifestations of pyemia shown in cases of localized phlebitis, far from the pelvis, in multiple visceral infarcts, especially of kidneys, spleen, liver or lungs; septic pneumonia, empyema, meningitis, septic endocarditis, arthritis, or remote abscesses.

Mucous membrane continuity causes, in slow cases, general endometrial infection, then by descending infection involvement of parts of the vagina and vulva. Except in cases of gonorrhea,

tubal involvement from continuity is probably much rarer than is generally supposed.

To illustrate the course of sepsis I have prepared an analysis of the autopsies in cases of death from sepsis at the Sloane Maternity Hospital covering a series of 14,500 cases.

There were thirty-seven deaths and thirty autopsies. Of these thirty cases twenty-one showed evidences of suppurative endometritis. The other nine cases, in which endometrial infection could not be demonstrated, are all of general peritonitis, as follows:

1. Eclampsia with death on the third day from general peritonitis, following rupture of uterus through bladder into peritoneal cavity.

2. Death on fourth day, general peritonitis, following infection of dermoid cyst of ovary, incised during labor, per vaginam.

3. Eclampsia, death on the third day from general peritonitis.

4. Death on the seventh day, general peritonitis, purulent pericarditis, empyema.

5. Death on third day, from general peritonitis, following rupture of double uterus after high forceps operation.

6. Death on fifth day from general peritonitis.

7. Death on nineteenth day from general peritonitis, complicated by infective necrosis of liver, bronchopneumonia and pleurisy.

8. Death on tenth day from general peritonitis, following rupture of tuboovarian abscess.

9. Death on sixth day from general peritonitis.

This list shows four cases with unexplained rapidly developing fatal peritonitis, probably examples of infection of sufficient virulence to pass rapidly through the lymphatics, leaving no gross changes behind. All the other cases, except No. 7 (that of pyemia with general peritonitis), are explained by immediate peritoneal contamination.

Among the twenty-one cases of purulent endometritis, the average day of death was the fourteenth.

Complications were:

Cases.

General peritonitis.....	9
Suppurative metritis.....	7
Infarcts of kidney.....	6
Suppuration of the broad ligament.....	5

Phlebitis of pelvic veins (in two cases of which the ovaries were involved).	5
Infarcts of the spleen (one of which showed a large subphrenic abscess of splenic origin)... .	4
Infarcts of lung.	3
Bronchopneumonia.	3
Empyema	3

The pelvic lymph channels showed purulent inflammation in two cases. There were four cases of tuboovarian infection—two cases of infarcts of the liver, two of malignant endocarditis, one case of infarcts of the heart muscles. Eight, or nearly 40 per cent. of these cases of endometritis were pyemic. Over 43 per cent. were complicated by general peritonitis. One case showed both conditions.

An analysis of the cases of peritonitis gave a total of eighteen. Of these, five were due to direct infection at delivery, from peritoneal injury. As has already been shown, only 50 per cent. of these cases gave evidence of intrauterine infection. Complicating the peritonitis, there were four cases of broad ligament infection, four cases of bronchopneumonia, and four cases of empyema. Three showed suppurating metritis; two, visceral infarcts; two, phlebitis of the uterine veins; two cases had pus tubes. There were one case of cellulitis of the sheath of the femoral and iliac veins, one case of pericarditis, one case of tuboovarian abscess, one case of necrosis of the vaginal wall. The average day of death was the ninth post-partum.

The vagina in two cases showed sloughs of the fornix, in one case opening into the pouch of Douglas. One vagina was generally inflamed.

The bladder was torn into, in one case, and infected. In another the lower half of the bladder was necrotic.

Abscesses in the uterine tissue were present in 23 per cent. of the cases. Two cases of gangrene of the uterine muscle were recognized. There was one sloughing fibroid.

There were five cases of pelvic abscesses, one of cellulitis, one case of abscess of the sheaths of the pelvic vessels, two cases of purulent pelvic vessels, and two cases of thrombosis of the ovarian vessels.

Ovarian and tubal complications were less frequent. In two cases the ovaries and tubes were matted together, there were one infected dermoid, one case of tuboovarian abscess, and two pus tubes.

As for conditions in other parts of the body, the kidneys showed most constant involvement. Suppurative renal lesions, abscesses or infarcts were present in seven or 23 per cent. In one case the infection was probably ascending from a bladder infected after symphyseotomy. The usual lesions were miliary infarcts, chiefly of the cortex.

In four cases the spleen had infarcts; in one a large abscess cavity communicating with a subphrenic abscess.

The lungs showed four cases of bronchopneumonia, four cases of empyema, three of infarcts, two of abscesses, one of bronchitis and two of pleurisy.

The liver had infarcts in three cases. The heart involvement showed one case of abscesses of the muscle, one case of purulent pericarditis and two cases with fresh mitral vegetations.

57 WEST FIFTY-EIGHTH STREET.

THE TREATMENT OF PUERPERAL INFECTION.*

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(With eleven charts)

As has been said regarding the education of a child, that the time to begin is one hundred years before it is born, so one can say regarding the treatment of puerperal infection that the time to begin is long before it occurs. The prophylactic treatment then is well regarded as the most important, and may be considered under two heads:

1. As concerns the patient.
2. As concerns the obstetrician.

The Patient.—Recognizing the fact accepted at the present day that the vagina does not normally contain pathogenic organisms, the writer believes that the antepartum vaginal douche in normal cases is not only unnecessary but harmful, from the increased risk of carrying infection from a non-sterile vulva without, to a sterile vagina within, and from the tendency to lessen the protective power of the vaginal canal. Two exceptions to this general proposition may well be taken.

*Read before the New York Obstetrical Society, March 13, 1906.

1. When there is evidence of a gonorrheal infection of the cervix and vagina.

2. When there is present a sinus discharging pus into the vagina from any pelvic abscess, whether that be a pyosalpinx, an ovarian abscess, or an abscess of a vulvo-vaginal gland.

When either of these conditions exists, I believe that a vaginal douche of bichloride 1-5000, given once or twice a day during the last week of pregnancy, followed by a lysol douche ($\frac{1}{2}$ per cent.), given as labor begins, not only lessens the risk to the eyes of the baby, but adds to the safety of the mother even if it does not eradicate the disease. With these exceptions I have abandoned the antepartum douche.

While formerly in my service at the Sloane Maternity Hospital a routine ante-partum douche was given, since June, 1898, in a series of 10,000 cases this douche has been omitted with results which compare favorably with those of the period when the antepartum douche was employed.

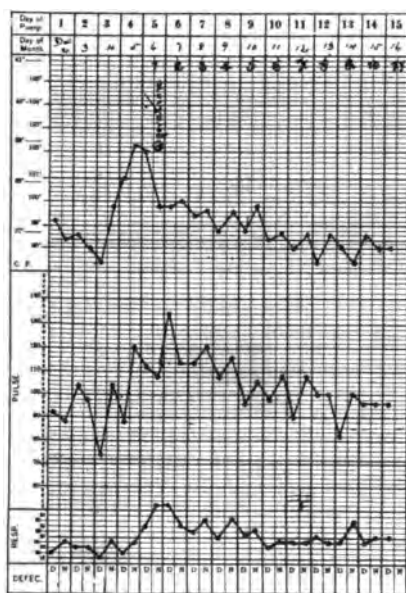
Of more importance than any attention to the vagina is the preparation of the vulva. The vagina we regard as usually sterile. The vulva we know is not sterile and only needs the passage of fingers or a douche nozzle along it to convey its organisms to the sterile canal above.

Of all the preparations of a patient for delivery I believe that of the vulva to be the most important. The clipping or shaving of the hairs (for the last six weeks we have been shaving the vulva of all ward patients at the Sloane with a safety razor), the thorough but gentle cleansing with green soap and sterile water of all parts of the vulva from clitoris to anus and well out on to the thighs, and then washing the parts with alcohol, bichloride and lysol solution, I consider the greatest safeguard against infection so far as the patient herself is concerned.

The Obstetrician.—Although in a maternity hospital where the staff delivering the cases is not allowed to do septic work, the use of rubber gloves may not greatly decrease the percentage of morbidity, I know of no greater safeguard against infection in private practice, especially in private general practice, than the use of sterile rubber gloves, and just here it should be mentioned that because gloves are used no less care should be taken in the cleansing and disinfection of the hands. The gloves are to be worn as additional safeguards to hands already made as nearly sterile as possible.

Passing now from the prophylactic to the actual treatment of infection arising during the puerperium, we are at once brought face to face with the fact that during the puerperium various infections of various organs may occur, which, were we to judge from the temperature chart alone, might easily be confused with infection of the parturient canal, yet are not, and indicate different lines of treatment according to the organ involved. The consideration of a few of these may not be out of place :

The fact that a woman has just been confined does not prevent her from having an attack of appendicitis, as is shown by chart

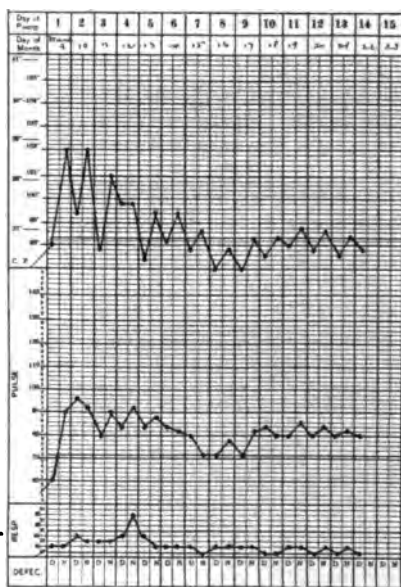


No. 1.—Suppurative appendicitis.

No. 1, which belongs to a case which on the 5th day gave evidence of a perforative appendicitis. The chart might suggest a uterine toxemia or bacteriemia, but on opening the abdomen I found a sloughing appendix with pools of pus in different parts of the abdomen. Her recovery would not have followed any treatment of the parturient canal.

An occasional cause of temperature in the puerperium is a pyelitis arising from a colon bacillus infection of a compressed and dilated ureter, usually the right. This, according to my ex-

perience, is not as common during the puerperium as during pregnancy, as, of 23 cases which have come under my care during the last five years, 17 occurred during pregnancy and 6 during the puerperium. Chart No. 2, belonging to one of these cases which started in the puerperium, might easily be mistaken for a case of infection of the parturient canal, but pain and tenderness in the region of the kidney (usually the right), an acid urine containing pus, and the finding of the colon bacillus in the urine, these usually determine the diagnosis, and the administration of a urinary anti-septic like urotropin, gr. v., q. 4 h., with large draughts of water,

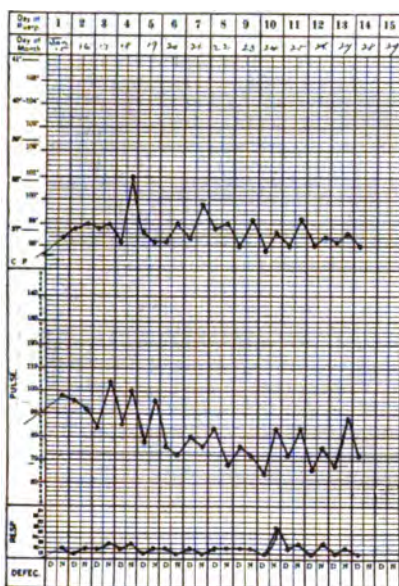


No. 2.—Pyelitis.

usually causes a subsidence of the temperature as indicated in this chart, without treatment of the parturient canal. In rare cases it must be mentioned, however, that the inflammation involves the kidney substance, causing a suppurative nephritis and demands a nephrotomy or nephrectomy for the cure of the patient.

In the general tendency of the present day to regard every rise of temperature in the puerperium as an indication of infection of the parturient canal, the pendulum in my judgment has swung too far, and instead of believing that milk fever never occurs, I am

firmly convinced that occasionally a rise of temperature occurs as indicated in Chart No. 3, the sole cause of which is a distention of the breasts from whose ducts the milk does not flow freely and the baby cannot or will not extract it. Emptying the breasts by massage or other means, emptying the bowels by a saline laxative, and the application of an ice-bag to the affected breasts cures the condition without treatment of the parturient canal. It must be borne in mind, however, that the most usual cause of a rise of



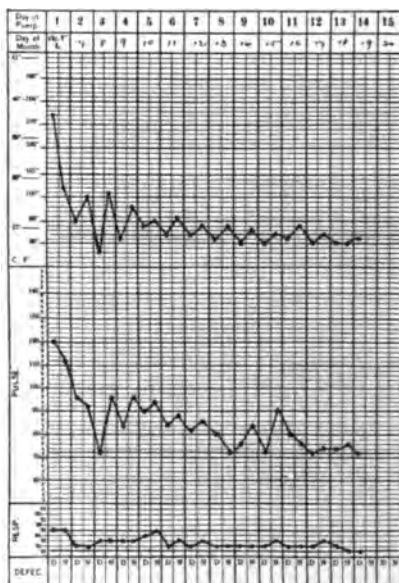
No. 3.—Distended breasts.

temperature in the puerperium is an infection of the genital tract, and in treating the distended breasts one must not forget that the two conditions often coexist, both distended breasts and an infection of the parturient canal, and both conditions may need treatment.

If the temperature does not come down as the breasts improve, look out for the uterus. In the case to which Chart No. 3 belonged both breasts were evenly distended, the lochia was free and normal and the parturient canal received no treatment.

Before speaking of the treatment of infection of the parturient

canal, I would like to call attention to Chart No. 4, which represents an elevation of temperature which, for lack of a better name, I have called a reactionary temperature. It is seen especially in cases having a long labor followed by a difficult artificial delivery. The temperature subsides within twelve hours and requires no treatment.



No. 4.—Reactionary temperature.

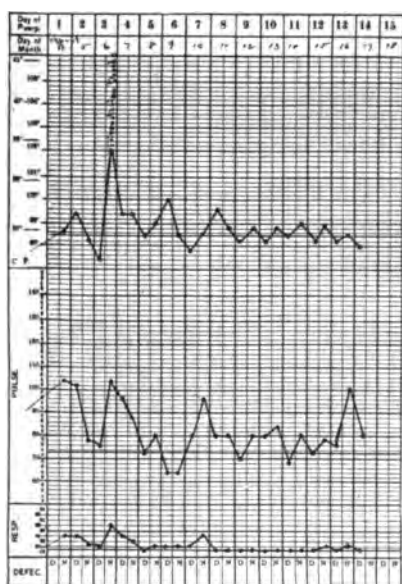
Coming now to infection of the parturient canal and its treatment, two conditions must be recognized:

1. *A Toxemia* due to the absorption of
 1. The products of putrefactive bacteria (often called sapremia), or
 2. The toxins of distinctively pathogenic bacteria.
2. *A Bacteriemia*, in which bacteria circulate in the blood (called also septicemia).

In the first condition the infection is local, the bacteria remaining in the parturient canal. In the second the infection is general.

In reviewing my experience in the treatment of puerperal infection as occurring in this series of 10,000 cases, I am impressed

with the fact that with one exception the only condition in which we are likely to greatly benefit our patients by treatment of the interior of the uterus is that of a toxemia, where the bacteria have not gone beyond the uterine cavity, and where this cavity contains decomposing organic material as blood clots, portions of placenta, etc. The exception mentioned above refers to a condition of the uterus often seen in a bacteriemia in which a superficial necrosis forms a pseudomembrane lining the uterine cavity, which nature apparently has difficulty in casting out of the uterus even if separated from the uterine wall. An infrequent gentle intra-uterine

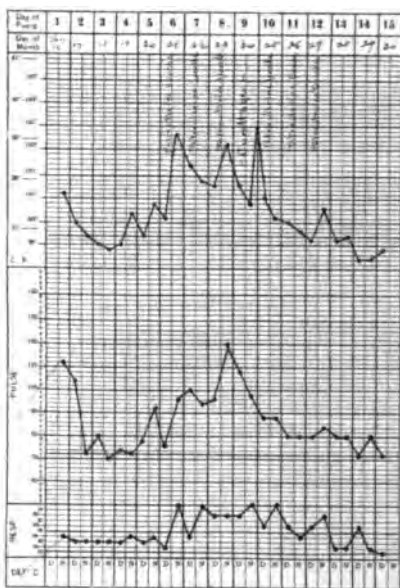


No. 5.—Puerperal toxemia responding to intrauterine douche.

douche in the course of a long bacteriemia, to make sure that there is no accumulation of this pseudomembrane in the cavity of the uterus, often lowers the temperature and hastens convalescence. Fortunately, with modern methods of surgical cleanliness in obstetrics the condition of a toxemia is the most common form of puerperal infection. For this reason I believe the best rule to follow is—consider every case of infection of the parturient canal a toxemia until you have evidence to the contrary. In other words, make sure that the uterus is free from decomposing organic

material in the shape of blood clots, portions of placenta, or membranes, retained lochia, etc., before deciding that the patient has a bacteriemia.

While attempting to put this rule into practice it is well to bear in mind a few facts. Nature endows the uterine wall with certain powers of protection against the invasion of the general circulation by bacteria or their toxins within the uterine cavity. Any lowering of the vitality of the uterine wall by manipulation or operation, tends to lessen this protective power and favors the spread of bacteria and their products. This is seen from the fre-

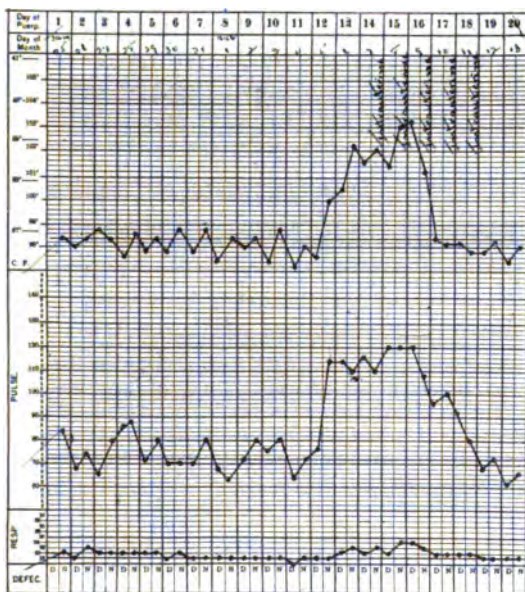


No. 6.—Toxemia not responding to intrauterine douche, but to curettage.

quency with which a curettage or even an intrauterine douche for puerperal infection is followed by an increase in temperature and perhaps a rigor. In carrying out the rule of emptying the uterus of decomposing organic material, the greatest care should, therefore, be taken to avoid injuring the uterine wall, and lowering its vitality. As means for emptying the uterus as suggested above we have the following:

- The intra-uterine douche;
- The finger;
- The curette.

If after emptying the bowels freely and excluding the breasts as the cause of the condition, the patient still shows an elevation of temperature, the indication is an intra-uterine douche given in a manner least likely to do harm. Recognizing the possibility of carrying infection from the vulva or vagina to the uterus, a speculum should be inserted and two douche nozzles used; the first to irrigate the vagina, the second, best a double current tube, to pass directly into the cervical canal and up into the uterus without touching vulva or vagina. The object desired is to wash out



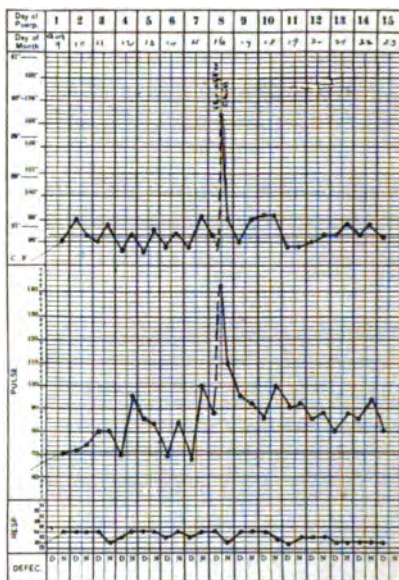
No. 7.—Toxemia due to flexion of the uterus.

débris with the least injury to the uterine wall. The action is chiefly mechanical and sterile salt solution is the douche of choice. In a large number of cases, in spite of the possibility of increasing the temperature for a few hours and perhaps causing a rigor, the douche empties the uterus and within twelve hours the temperature and pulse are nearly normal, as occurred in Chart No. 5.

If the intra-uterine douche brings away débris but does not lower the temperature, after one or two repetitions, my custom is to explore the uterus under anesthesia and make sure that it is empty, for this purpose using the finger, as far as possible, and

the curette only as a substitute for the finger when the latter is incapable of doing the work. Throughout this procedure the greatest care is observed to remove the blood clots and portions of placenta or membranes as gently as possible. The result is well shown in chart No. 6, which also shows the increase in temperature immediately following the curettage, a result already referred to as common.

The question now arises: How often should intra-uterine douches be given, and how long should they be continued? At



No. 8.—Mastitis.

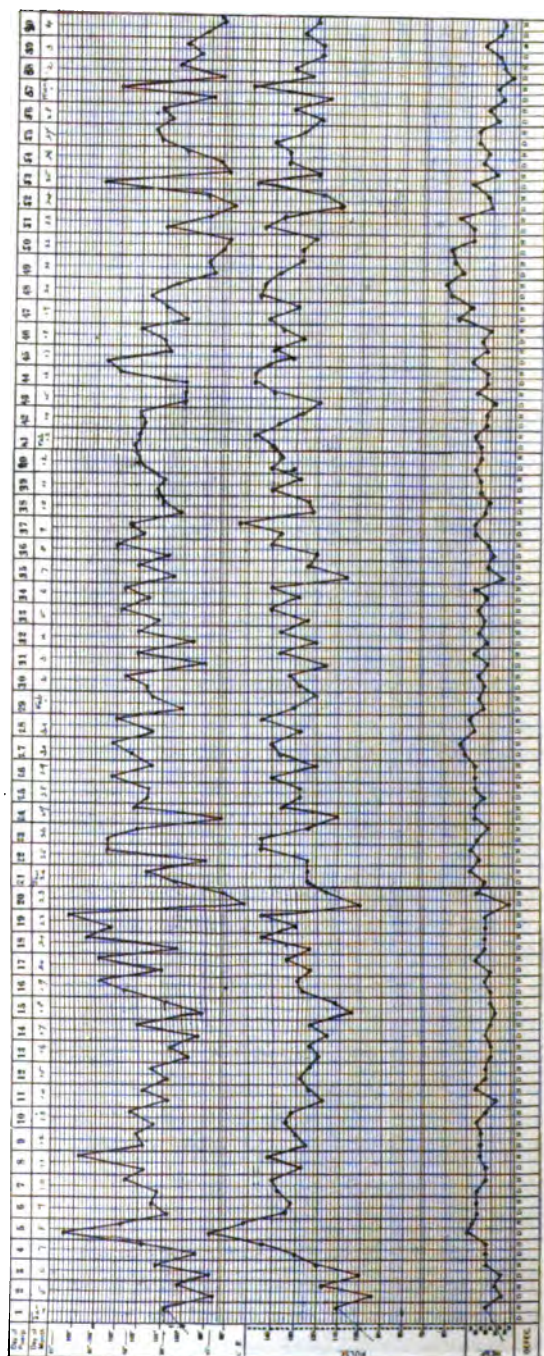
the Sloane we never give more than one ultra-uterine douche a day, and as the object of the douche is to empty the uterus of loose organic material, we cease douching as soon as we cease to find débris in the return flow.

Another phase of puerperal toxemia, or sapremia, which is not generally recognized, is that which occurs in the second week of the puerperium, perhaps late in the second week, and in a puerperium which has shown no rise of temperature until this time. It is illustrated in chart No. 7 and is caused by a retention of the lochia due to a flexion of the uterus either anterior or posterior.

This chart represents the condition caused by a retroflexion, but a not uncommon picture is that of a woman who when married had an anteflexed, poorly developed uterus, which had to be dilated to enable her to become pregnant, who after delivery had a normal course until the 8-12 day, when the temperature suddenly rose from a retention of the lochia due to the return of the uterus to its former condition of anteflexion with stenosis of the canal. Sometimes a hot vaginal douche will cause the uterus to expel its contents, but often an intrauterine douche repeated on one or two successive days is necessary. Often on the introduction of the douche nozzle purulent lochia will be seen to gush out. The writer believes that some of the temperatures seen on the first day that patients are allowed out of bed are caused by the increased anteflexion of the uterus with interference with uterine drainage. Another cause of a sudden rise of temperature late in a puerperium, which has been normal until this time, is a mastitis, as shown in chart No. 8. This patient had a rigor with a sudden rise of temperature, as appears on the chart. In one breast was found a distinct tender lump. Massage of the breast with the application of an ice bag to it, and the administration of a saline cathartic soon brought the temperature to normal, where it thereafter remained.

We come now to a more serious phase of puerperal infection—a bacteriemia, or general septicemia, in which the bacteria have passed beyond the parturient canal into the general circulation.

What is the treatment? When the science of bacteriology was first applied to the study of post-partum, parturient canal, it was hoped that at last we had secured a sure guide to the treatment and prognosis of puerperal infection. I regret to say that thus far it has given us very little help in treatment, and as for prognosis it is often very disappointing. Cases from which cultures show numerous streptococci sometimes get well promptly, while those in which no streptococci can be found often go from bad to worse and die. We are still compelled in the majority of cases to make our diagnosis of a bacteriemia, with its grave prognosis, by the failure of our treatment of the case on the basis of a toxemia, and by finding the uterus empty. As an additional aid to this diagnosis one often finds in the early stages of this condition, especially if due to streptococcus infection, a superficial necrosis, or pseudomembrane, on the cervix and on any abrasion in the vagina. This same pseudomembrane also occurs in the uterus.

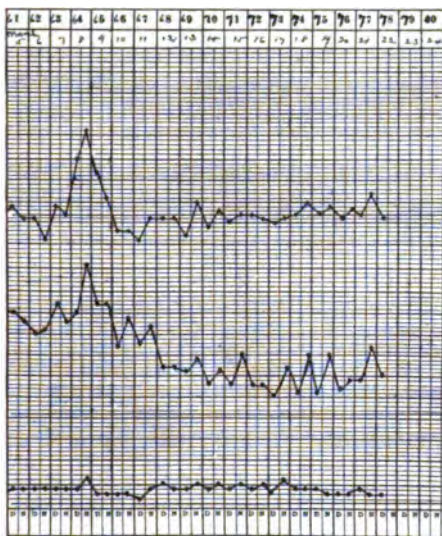


No. 9.—Puerperal bacteremia.

When once it has been determined that the uterus is free from decomposing organic material, the interior of the uterus should not again be invaded, save for the indication mentioned in an earlier part of this paper, *viz.*: to ascertain at infrequent intervals, by a gentle intrauterine douche, that there is no retention in the cavity of the uterus of pseudomembrane which has separated from its wall.

The treatment, then, of a puerperal bacteriemia is chiefly that of the general condition.

It is well known to members of this society that any medication or food tending to maintain or increase the strength of the



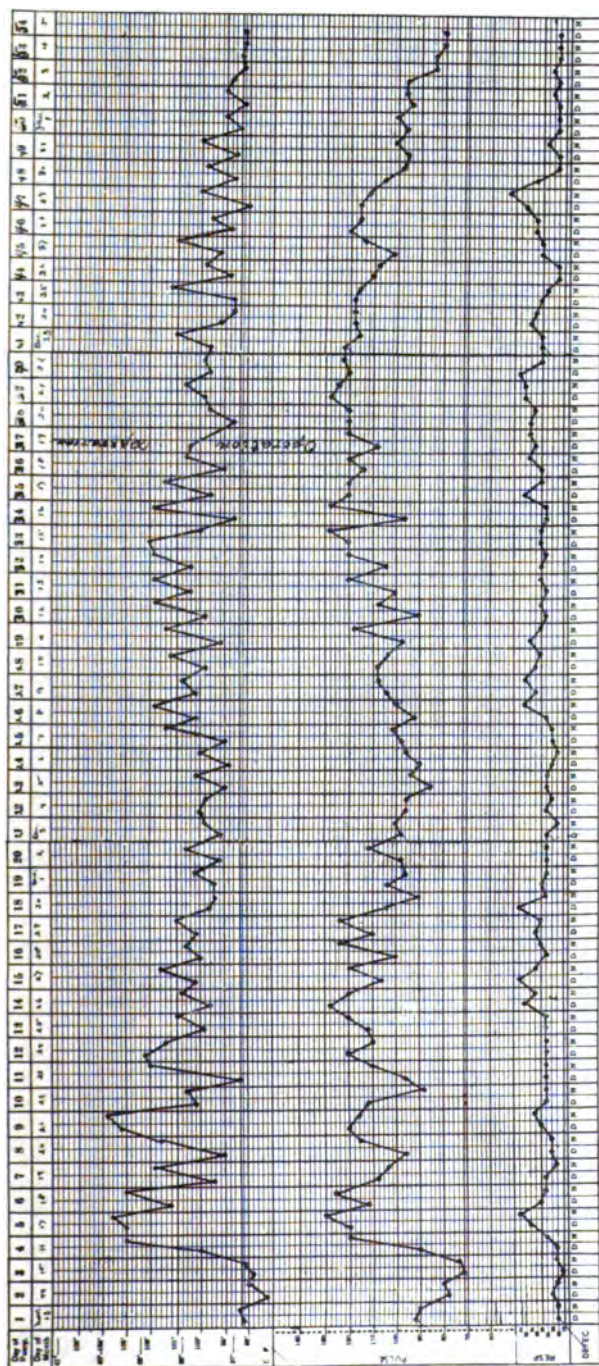
No. 9.—Concluded.

patient becomes a valuable ally to her leucocytes in their fight for the victory.

Of drugs, alcohol and strychnine have given me the best service.

To hasten involution of the uterus, an ice bag applied to the fundus with or without the administration of drugs stimulating uterine contraction has seemed of value.

A patient suffering with puerperal bacteriemia presents so many sudden changes in her condition that one has to be very careful in coming to the conclusion that, because she presented marked im-



No. 11.—Pelvic cellulitis.

provement after the use of a given remedy, it was due to this remedy. The improvement might have occurred any way.

I have used unguentum Credé in a great many of these cases and in a few it has seemed to increase the resistance of the patient to the disease. On the other hand, I have used it many times with no apparent benefit, and to-day I can only say that I have never seen it do harm. The experience of other observers with injections of collargolum, either intravenous or rectal, seems to correspond closely with my experience with unguentum Credé.

The occasional administration of large saline enemata is in my judgment of distinct value.

A few years ago our hopes were raised by the introduction of an antistreptococcic serum. Many of us have tried it and all of us have, I think, been disappointed in it.

It is now well established that a large number of infections are mixed infections and a serum to be satisfactory will probably have to be multivalent in character and not simply an antitoxin for one variety of bacteria. Although there is good ground for hope that in the future a satisfactory serum will be obtained, at present there is none available.

We now come to the discussion of the value of radical pelvic surgery in puerperal infection. Viewing the condition as either a toxemia or a bacteriemia, I believe that we can all agree that as long as a patient is suffering merely from a toxemia with bacteria limited to the cavity of the uterus, hysterectomy is out of place. Furthermore, if the patient is suffering from a general bacteriemia with bacteria circulating freely in the blood, and no localization of the process in the uterus or adnexa, removal of the uterus, or uterus and appendages, is, on the one hand, not going to get beyond the disease, but on the other hand is bound to so reduce the patient's power of resistance as to sacrifice the lives of many women who would have recovered if not subjected to surgery. The way some of these women recover after weeks and even months of fever, and after various complications, is perfectly remarkable, and only comparable to typhoid fever. It is well shown in chart No. 9 which belongs to a case which had fever for sixty-five days with one joint after another involved, even the temporo-maxillary articulation, and yet a few months after leaving the hospital presented the picture of perfect health. Many of these cases recover if we only help, not handicap, nature in her efforts.

On the other hand, there are a few cases in which the infection has largely localized itself in the uterine wall and in which a hysterectomy is indicated as the only means of saving the patient. No one who has removed a uterus studded with abscesses could believe that any other operation would have been successful. In my experience, however, these cases are rare, occur late in the puerperium rather than early, and the operation has always a high mortality. In five of these operations performed by the writer the mortality was 60 per cent.

During the latter half of the puerperal month if a pyosalpinx has developed and is maintaining the temperature as in chart No. 10, its removal is indicated with or without a removal of the uterus according to the condition of the latter organ, and can often be performed with success. In my experience the later in the puerperium this operation is required, the better the prognosis.

My rule is never to perform, during the puerperium, a hysterectomy for puerperal infection unless I can obtain evidence of a localization of the infection with pus formation either in the uterine wall or in the appendages. I have operated upon a number of cases of general suppurative peritonitis, the result of puerperal infection, but have never saved a case. Another phase of puerperal infection is that represented in chart No. 11. An infection localized in the pelvis but outside the uterus—a pelvic cellulitis. As the temperature continued for a considerable time and I could feel a mass at the side of the uterus, not being able to exclude a pyosalpinx, I opened the abdomen. Finding the inflammation extraperitoneal, between the folds of the left broad ligament, I closed the abdomen, expecting to drain later per vaginam if the mass suppurated. Under the treatment of ice bags over the mass, the cellulitis subsided as shown by the chart. No suppuration occurred and no vaginal incision was made.

If pelvic abscesses form as expected in the above case, and are near the vagina, I believe the proper treatment is vaginal incision and drainage.

In conclusion, I would recommend, in the surgical treatment of puerperal infection, the selection of the operation which will rid the patient of her immediate danger with the least amount of shock.

TWO CASES OF BILATERAL DERMOID CYSTS: ONE
SHOWING CARCINOMATOUS DEGENERATION, THE
SECOND COMPLICATED BY THE PRESENCE
OF AN EIGHTY-ONE POUND MULTI-
LOCULAR OVARIAN CYST.*

BY

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With two plates.

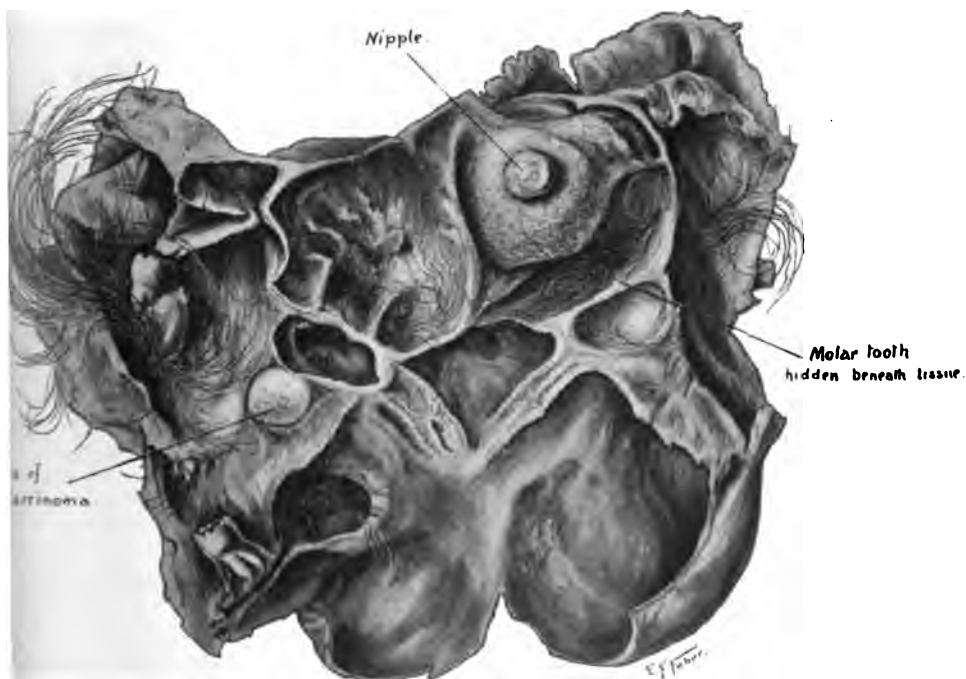
THE first case that I have to report is one of double dermoid cyst of one ovary and a single dermoid cyst of the opposite ovary. This case is of interest chiefly from the pathological standpoint. The case occurred in the Kensington Hospital. I am indebted to Mr. C. P. Noble for the privilege of reporting it.

Path. No. 1196.—The specimen consists of two multilocular ovarian cysts. The tumors are similar in general character. They are rounded, somewhat lobulated, each about the size of an orange, rather thin-walled. The surface is free of adhesions. On section they contain sebaceous material and hair. One cyst is slightly smaller than the other and contains three main loculi. Both externally and internally it gives the appearance of two cysts which have become fused. If the theory that these cysts are due to an inclusion of the ectoderm is accepted, it is easy to see how two originally separate cysts might arise in one ovary; in fact, as many as eight separate cysts have been described springing from a single ovary. The tumor from the opposite ovary shows more numerous and rather smaller loculi; it also contains sebaceous material and long reddish-brown hair, similar to that seen in the other tumor; in addition, it contains two well-formed molars and one incisor tooth. Springing from the wall of the largest cyst cavity is a well-formed nipple; near the center of the cyst and in the entrance of one of the thicker septa is seen a round yellowish area 1 cm. in diameter. On microscopic examination this proved to be an area of adenocarcinoma. The microscope also showed the tumor to contain skin, hair-follicles, sweat glands, muscle

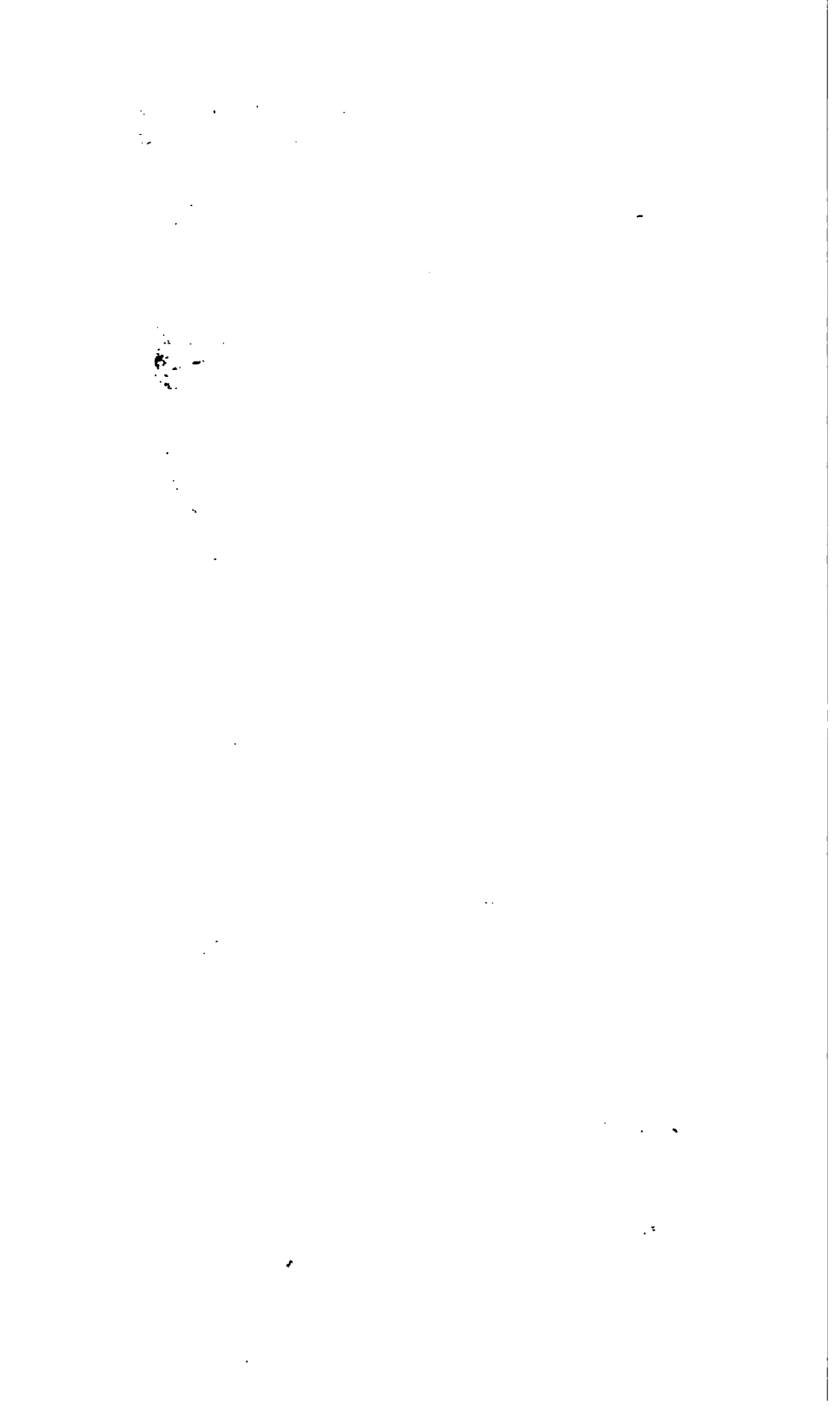
*Read before the Section on Gynecology, College of Physicians of Philadelphia, April 19, 1906



Case I.—Two dermoid cysts springing from right ovary.



Case I.—Tumor of left ovary opened on its anterior surface.



and mammary gland tissue. The area of carcinoma was some distance from the mammary gland, and probably had its origin in the sweat glands of the skin. The case is of especial interest from the probability of the double origin of one of these tumors and also from the adenocarcinoma which was found.

The frequency with which dermoids occur in comparison with other ovarian tumors is somewhat variable. Roberts gives it at 3.5 per cent., while according to Pfannestiel it is 7.5 per cent. At the gynecological laboratory at the University of Pennsylvania we have found ten dermoids occurring in a series of ninety-two ovarian tumors, or a little more than 10.8 per cent. Of these, two cases have been bilateral.

Carcinomatous degeneration in a dermoid is an extremely rare complication. It seems safe to say that less than 0.25 per cent. of these tumors are malignant. I have not attempted to go over all the literature on this subject; but, up to 1898, but eight such cases had been reported. The majority of carcinomata occurring in dermoid cysts are of the squamous celled variety.

The second case is also one of double ovarian tumors; the following is the history:

Path. No. 1248.—Age, 57 years. The family and general previous history is unimportant. The onset of the present trouble began twenty years ago, when, while lifting a heavy weight, she felt something "give way" in her abdomen. On examination she discovered a swelling about the size of an apple in the lower left quadrant. For about four years this steadily increased in size, at the end of which time it was as large as a full-term pregnancy. From then on until her menopause, which occurred six years ago, there was but little increase in size. For the last four years, however, it had grown rapidly. There were practically no subjective symptoms until three weeks before her admission to the hospital, except those caused by the great weight of the tumor.

Physical examination showed a large, well-nourished woman; the heart, lungs and kidneys were normal; the abdomen was enormously distended; the greatest circumference was 63 inches; from symphysis to umbilicus, 16 inches; from umbilicus to ensiform, 22 inches.

At operation the tumor was tapped and removed without any very great operative difficulty. Sixty-six pints of straw-colored fluid were removed and a considerable amount was lost. On examination of the pelvic cavity after the removal of the large

tumor, a small parasitic cyst, evidently having had its origin from the opposite ovary, was found and removed.

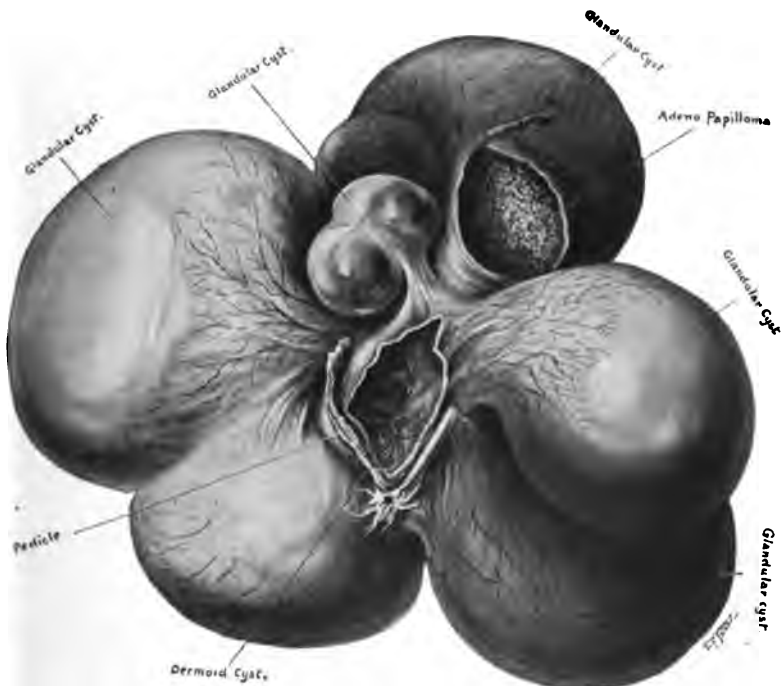
The patient stood the operation well. The pulse and breathing, which, when she first came on the operating table, had been rather rapid, improved as soon as the intra-abdominal pressure was normal. Before operation the patient weighed 247 pounds and after operation 165 pounds. The convalescence was entirely normal until the twelfth day, when the patient was suddenly seized with a sharp pain in the right side of the chest, accompanied by dyspnea and tachycardia. These symptoms gradually improved, but on the fifteenth day she had a similar attack, after which her convalescence was uninterrupted and she left the hospital on the twenty-eighth day after operation, cured. The attacks were evidently due to embolism.

The pathological report shows the right-sided tumor to be a parasitic dermoid about the size of a lemon, poor in blood supply, and containing hair, sebaceous material, and skin. It shows calcareous degeneration. The tumor of the left side is an enormous multilocular cyst, made up of five main cysts. These are relatively thin-walled and in some areas show a poor blood supply. Some of the small cysts contain pseudomucin. One of the cysts is rather different from its fellows in general appearance, and on section contains sebaceous material, skin and hair. Another of the small cysts is covered on its inner surface by papillary masses, which on histological examination prove to be simple adenopapillomata. The pedicle is 5 cm. in breadth and 7 or 8 mm. in thickness. It seems probable that the dermoid was the primary tumor and that the glandular cyst and the papilloma were of later origin. In the examination of a very limited portion of the literature of ovarian tumors, I have found a number of very large cysts reported. Perhaps the largest was a cyst removed by Mr. Cartledge of Louisville, which weighed 245 pounds. Bullitt, in his report of this case, has collected the records of 23 other cases in which the tumor weighed over 100 pounds. In examining the histories of these cases of large ovarian cysts one is struck by two rather peculiar features; one is that in many cases there are few subjective symptoms except those produced by the weight of the tumor, and the other is how well these patients seem to stand operation. It would seem that in cases of large tumors, the necessarily greatly enlarged blood vessels and the lax condition of the abdominal walls would

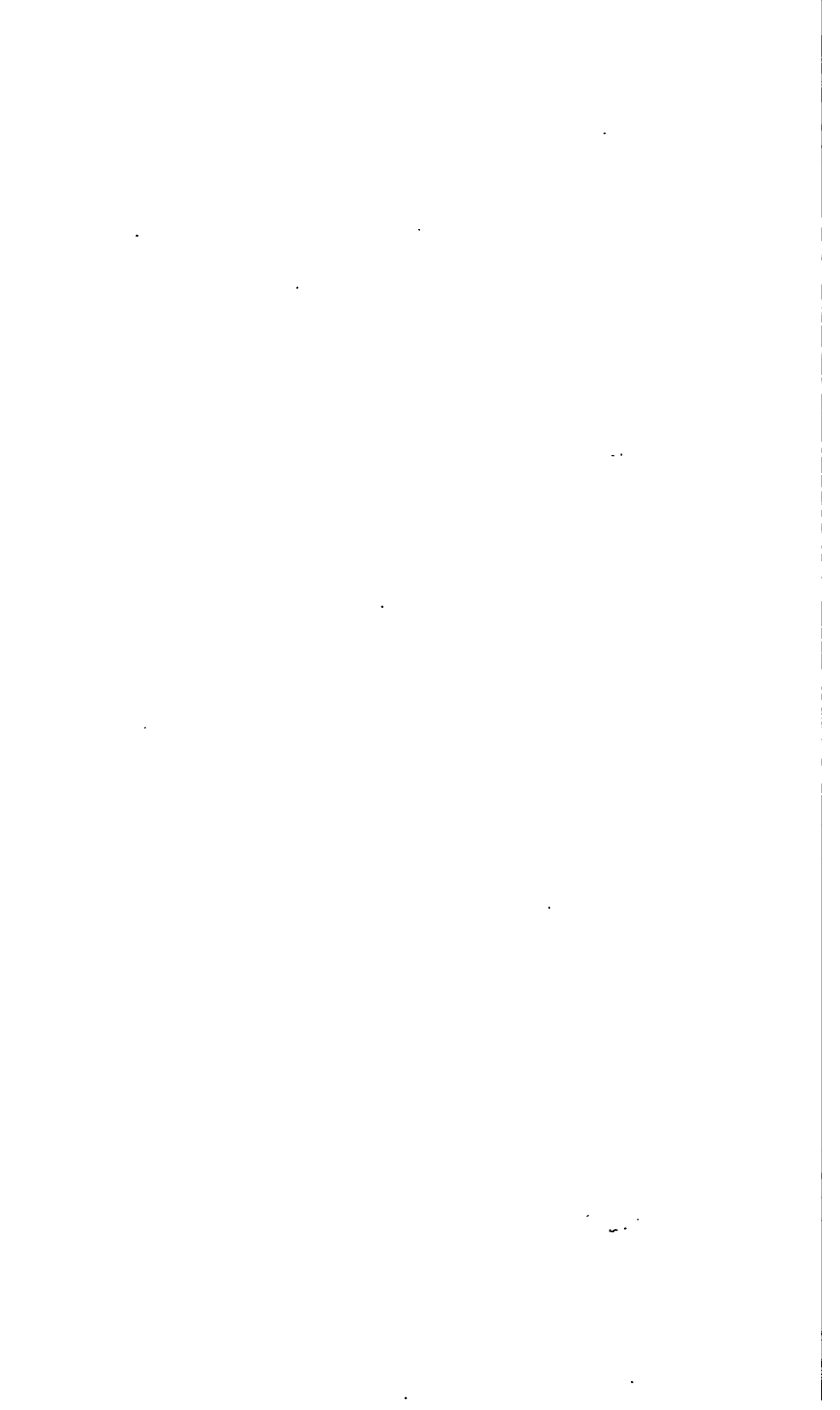
AMERICAN JOURNAL OF OBSTETRICS
AND
DISEASES OF WOMEN AND CHILDREN
JUNE, 1906



Case II.—Parasitic dermoid cyst of right ovary.



Case II.—Eighty-one pound glandular cyst combined with a dermoid and papilloma, springing from left ovary.



greatly favor the formation of emboli. Practically, however, this does not seem to be the case, as I have found but few records of such postoperative complications. Another very definite postoperative complication is the lax condition of the abdominal walls. It is most important that these patients should wear a firm abdominal binder for some time after operation. It would seem, theoretically at least, that ptosis of the stomach, colon, liver and other organs might easily result if this were neglected. It would be of interest to examine some of these cases a year or two after operation, to ascertain how much of the original tonicity of the abdominal wall had been regained.

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THE CAUSES AND TREATMENT OF METRORRHAGIA,
WITH SPECIAL REFERENCE TO THE USE OF
SCHATZ'S METRANOIKTER AND
ATMOKAUSIS.

BY

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THE causes of metrorrhagia are best considered under the two heads, the constitutional and the local. The constitutional causes may be any of the acute infectious diseases: malaria, valvular heart disease, cirrhosis of the liver and rarely anemia. The local causes are the more frequent, and among the most important are hyperplastic endometritis; displacements of the uterus; any chronic inflammation of the uterus, tubes and ovaries; intrauterine polyps; pelvic tumors, particularly fibroids; hypertrophied angiomatous decidua, persisting sometimes months after an abortion; and occasionally, intrauterine varicose veins at one or both cornua. In women approaching the menopause, must be added uterine cancer and fibroid degeneration of the uterus, though these may exceptionally occur in young women. The profuse metrorrhagia sometimes seen in young girls is usually due either to hyperplastic endometritis or some constitutional cause such as valvular heart disease. The cause of hemorrhage during pregnancy will not be considered in this paper.

The hemorrhage begins usually as an increased menstrual flow, and sooner or later becomes irregular and sometimes practically continuous, without any suggestion of periodicity. The diagnosis of the cause is often difficult. Should one of the constitutional lesions be discovered, with no obvious cause in the pelvic organs to account for the hemorrhage, it is possible that appropriate medical treatment may be all that is required, but usually some local treatment is needed before the bleeding can be controlled.

Medicinal Treatment.—The internal administration of styptics is often successful. Ergot, suprarenal extract, desiccated mammary gland, hydrastis, or hamamelis may be given a trial. The most powerful combination is one of ergotin gr. 1, stypticin gr. $\frac{1}{2}$.

and hydrastinin gr. $\frac{1}{2}$, given four times daily. The objection to this prescription is that it is expensive, but it has proven the most effectual of the styptics.

The use of the galvanic current, the positive pole to the uterine sound, with a current of fifteen to forty milliamperes for five to ten minutes every other day, has given good results. This treatment can be carried out in the office, without the use of an anesthetic. Local applications to the uterine cavity of strong nitrate of silver solution, tincture of iodine, Monsell's solution and others of the same character are dangerous. The likelihood of infection is great and many patients thus treated suffer extremely from uterine colic, and in office practice at least this form of treatment is not advisable.

A large percentage of these patients will require curettement of the uterine cavity, after dilatation of the cervix. This is best done under an anesthetic, the cervix being dilated with two- or four-branched dilators and thoroughly curetted and douched. In any curettement for uterine hemorrhage, the uterine cavity should be thoroughly explored with placental forceps on account of a possible polyp which the curette alone might easily slip over and fail to extract. Many a case of uterine bleeding resisting treatment and repeated curettements has been due to this.

Occasionally the bleeding will resist several curettements and will obviously require something further. The choice must rest between cauterization of the endometrium, preceded by another thorough curettement, and hysterectomy, with the less radical plan deserving of a trial. The cauterization is carried out by the actual cautery or by atmokausis—the injection into the uterine cavity of superheated steam at 110–115° C. for five to fifteen seconds or even longer. The actual cautery is extremely difficult to control, may burn to a much greater depth than was intended, and has a very limited field, if indeed it should be used at all. The technique of atmokausis is as follows: The cervix is dilated, under an anesthetic, to three-quarters or one inch if the two-branched dilator, or a circumference of 85 mm. if the four-branched Cleveland dilator is used, and the uterus thoroughly curetted, explored with placental forceps, and washed out with sterile water through an intrauterine catheter. 31 c.c. of hot water is introduced into the boiler of the atmokausis apparatus and the alcohol flame is started under the boiler. The intrauterine nozzle of the apparatus, sterilized

by soaking in 5 per cent. carbolic acid solution, is screwed on to the handle, all the joints being tightened, and as soon as steam is generated, the stop cock is turned slightly to test the tubes and make sure the lumen is free. The nozzle is then inserted into the uterine cavity, the point being near, but not touching the fundus. When the thermometer on the boiler registers 115° C. the steam is allowed to flow through the nozzle for ten, fifteen or twenty seconds, or as long as the individual case seems to require. The uterus is then washed out again, and the patient returned to bed. She is left in bed ten days, and during her convalescence may require intrauterine douches if a foul leucorrhoea develops. With the method of allowing the steam to circulate in a closed metal catheter or *zestokausis*, trusting to the hot metal to effect the cauterization, I have no personal experience.

In a total of eight or ten cases in which this method has been tried in the hands of Dr. B. C. Hirst and his assistants, in only one case, so far as is known, has it been necessary to repeat the application. One patient, at least, was entirely relieved of all bleeding and subsequently became pregnant.

As a last resort it may be necessary to remove the uterus, when all other means to control the bleeding have been given an adequate trial and have failed. The hysterectomy may be done by either the vaginal or the abdominal route, as the operator prefers. When the bleeding has been due to cancer of the uterus or fibroid or other pelvic tumor, any treatment directed to the uterine cavity is of course unnecessary, and the removal of the offending growth is obviously required. It is often advisable in the diagnosis of these cases to make a thorough examination of the uterine cavity before expressing an opinion as to the treatment required. This may be done in one of four ways: (1) Forced and rapid dilatation under anesthesia; (2) gradual dilatation by a tent, or (3) Schatz's *metranoikter*; and (4) the use of the *metroscope*.

The forced and rapid dilatation is often inadvisable; it is difficult to secure sufficient dilatation without serious injury to the cervix, and it usually requires prolonged anesthesia. The tents, while efficient, are dangerous and have an unreliable record of septic infection, though with proper care they may sometimes be used. Schatz's *metranoikter*, a two-branched steel dilator with a spring to force the branches apart, is a most efficient instrument. It has been modified by Dr. Barton C.

Hirst to a four-branched model, which is more efficient than the original one, but requires a slightly greater dilatation of the cervical canal to secure its insertion. It is designed to be introduced into the uterine cavity, the spring remaining in the vagina, and allowed to remain in place for twenty-four hours. During its insertion the blades are held in apposition by a special handle, and are allowed to separate when it is fully introduced. When used for dysmenorrhea, a thorough dilatation and curettement precede its insertion; when used to secure dilatation in metrorrhagia, especially in women who have borne children, it can be inserted without an anesthetic. A little gauze is packed around and under the spring in the vagina, to prevent bruising of the vaginal walls. When it is removed, twenty-four hours later, it is possible to pass one finger, or if the four-branched model has been used, even two fingers, up to the fundus and make a careful digital examination of the uterine cavity. The instrument causes little pain, only 10 per cent. of the patients requiring any narcotic. When the instrument is removed, the uterus must be carefully irrigated. As far as our experience goes, it is free from danger of sepsis, when proper aseptic precautions are taken.

With the metroscope, an instrument on the plan of a cystoscope for the direct inspection of the uterine cavity, I have no personal experience, but am somewhat skeptical as to its practicability.

TUBERCULOUS INFECTION OF UTERINE MYOMATA.

BY

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With one illustration.

Of the various conditions associated with uterine myoma, tuberculosis of the tumor itself is among the very rarest. When we consider the infrequency with which tuberculosis and myoma are found together in the generative organs, it is not to be wondered at that many of our large clinics have yet to report a case.

In reviewing the statistics of 1,800 cases of uterine myomata, one case showed an associated tuberculosis of the endometrium¹

and one tuberculous salpingitis and oöphoritis.² In no instance in the statistics examined have I been able to find reported a case of tuberculous infection of a myoma. This rare condition is of interest only so far as it goes to make up the literature of complications of uterine myoma. For that reason I am prompted to report this case.

The patient was operated on in the Troy Hospital by one of the attending surgeons and the specimen sent to the pathological laboratory for examination.

Mrs. C. F., age 43, housewife, U. S., Troy, N. Y.

Family History.—Father and mother alive and well. Two sisters and one brother died of tuberculosis. No history of heart disease or rheumatism. A sister had breast removed for cancer.

Personal History.—Had diseases of childhood; typhoid fever fifteen years ago. Menstruation ceased eighteen months ago. Never had any children. Appetite good, no nausea or vomiting, bowels regular. No trouble in urinating at present; in the spring of 1905 had burning pain. No cough, no shortness of breath, no expectoration, no loss of weight or strength. About eight years ago had some enlargement of the womb, with a slight discharge. Has had no pain, chills or fever.

Operative History.—Abdomen opened in the median line; supracervical hysterectomy; tubes and ovaries slightly adherent; no free fluid in the abdomen; parietal and visceral peritoneum smooth. Abdomen closed in the usual way.

Pathological Report.—Surgical No. 811, Specimen No. 57-116.
Nov. 20, 1905.

The specimen consists of the uterus tubes and ovaries, the uterus being the seat of a new growth. The uterus is amputated at about the internal os. Several myomata, subperitoneal and interstitial, are found in the uterine wall. The largest myoma, which is of the subperitoneal type, springs from the posterior of the fundus near the left cornu and measures $6 \times 4\frac{1}{2} \times 3\frac{1}{2}$ cm. Six myomata in all. They vary in size from the one described down to $\frac{1}{2}$ cm. in diameter.

On section all except one show a great number of cheesy necrotic areas of the gross appearance of miliary tubercles. The largest area giving this appearance measures $\frac{1}{2}$ cm. in diameter. Two of the smaller myomata, both subperitoneal, are converted into a white necrotic material of the consistency of putty.

The uterus on section does not show any dilatation of the cavity. The walls are 3 cm. in diameter and do not show necrotic areas.

The endometrium is slightly thickened and bathed with a sticky bloody fluid. Tubercles are not discernible in the endometrium.

The left tube measures 13cm. long, the right 12cm., and both are similar in gross appearance. The inner third of each tube is normal in diameter, while the outer two-thirds of both average 2 cm. in diameter. With the exception of a slight perisalpingitis the peritoneal covering of the tubes is normal. On section, the walls are thickened. The mucous folds are studded with numerous tubercles.

The ovaries show only a mild perioöphoritis.

Anatomical Diagnosis.—Multiple myomata of the uterus, showing tuberculous infection. Bilateral tuberculous salpingitis. Chronic endometritis. Perioöphoritis.



Tuberculous infection of uterine myomata.

Microscopical Examination.—Sections of ovaries normal except a few tags of fibrous tissue on the surface.

Tubes.—Most of the sections of the tubes show thickened walls, round-cell infiltration of the musculature, the mucous folds in some places adherent; an excess of connective tissue; polynuclear leucocytes along the epithelial lining; tubercles in almost every field, many with necrotic centers, others with giant cells. The tubercles appear to be limited to the mucous membrane and are not seen in the muscular or the serous coat.

Uterus.—The mucosa is thickened and shows a marked glandular hyperplasia. Scattered among the glands are numerous miliary tubercles, very few of which show necrotic centers. The epithe-

lium on the surface of the mucosa is present. The uterine muscle at that point lying next to the mucosa shows round-cell infiltration. In none of the sections of the muscle were tubercles found.

Tumors.—The tumors are made up of bundles of muscle fibers enveloped by connective tissue bands. In places are gland-like structures lined with columnar epithelium. Large areas of necrosis, many covering whole fields, are found in most of the sections. These are the result of the coalescing of necrotic tuberculous areas. Tubercles, many with giant cells, are frequent, while the majority have necrotic centers.

Microscopical Diagnosis.—Tuberculous infection of uterine myomata (one of which is an adenomyoma); tuberculosis of the endometrium and a slight chronic metritis; tuberculous salpingitis (bilateral); normal ovaries excepting a few fibrous tags on the peritoneal surface.

This seems to be a case of primary tuberculosis of the tubes. Examination failed to show evidence of tuberculosis in any other part of the body, this being carefully sought for because of the bad family history. It is of interest to know that the husband appears free from tuberculosis, eliminating possible infection from that source.

Inasmuch as the tubercles in the endometrium were only microscopic, while those in the tube were plainly macroscopic and showed marked necrosis, the natural inference is that the endometritis was the result of a descending infection from the tubes.

The uterine lymphatics, no doubt, carried the infection directly to the tumors.

The figure shows the gross appearance of the specimen. The left tube is split, showing the tubercles. The large subperitoneal myoma on the cut surfaces shows the necrotic areas which were found throughout the tumor. The small tumor springing from the fundus is of a chalky white appearance and consists only of a sac wall filled with a material of the consistency and color of putty.

¹ Kelly, H. A. *Operative Gynecology*.

² Kelly, J. K. (Glasgow) Localized Telangiectatic Condition of a Fibroid with Tuberculous Disease of the Ovaries and Tubes. *Brit. Med. Journal*, Lond., 1905, II, 712 (S. J. M. Cameron).

CONSERVATIVE SURGERY OF THE UTERINE ADNEXA.*

BY

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IN presenting this subject to the American Medical Association in New Orleans in 1903, as the president's address, entitled, "The Trend of Gynecology," Dr. Dudley reported 269 cases, most of which he carefully followed out, and 1899 cases from the work of other prominent operators. In the presence of such an important paper written so recently I would hesitate to take up this subject, except for the fact that some little points have not yet been settled. Such points are: how many patients with both tubes resected became pregnant, how many patients had to be operated on again, how many patients had to be reoperated upon from whose tubes pus had been emptied out, the tubes cleaned and a new opening made?

I think we can take up the work where these men have left it, and may perhaps come to some definite conclusions through careful records of the size and condition of the tubes and of the ovaries, of the work done, and of the results following it. One case or two cases reported by an individual in that way may be of real value in the surgical world, because from a collection of such reports we can draw some conclusions.

The history of this subject has been very thoroughly worked up. Kahn, of Paris, has written a book in which he has traced the origin of conservative work and followed it down to the present time.

Polk and Dudley may be considered as pioneers in this country in conservative surgery of the tubes and ovaries, but conservative work emanated from abroad. Dudley began his work in 1887, and published a paper in the *Journal of the American Medical Association*. He then considered that his work on the ovaries was experimental, but by 1891 he had so operated upon 190 cases without a death. He reported plastic work on both ovaries in 128 cases, on one tube with removal of one ovary in 61 cases; tube bisection and removal of one-half of each tube

*Read before the Woman's Hospital Society, January 23, 1906.

for gonorrhea in 5 cases; vaginal section for drainage in 14 cases; nephropexy in 4 cases; hysterorrhaphy in 73 cases; appendectomy in 14 cases; and curettage in 29 cases. I believe that most of us, when we have to do plastic work, curette, but he did it in only 29 cases out of 190. Of the cases followed up, 137 were cured, 11 suffered pain, and 42 were not traced. Among the 148 kept under observation there were 28 pregnancies; not quite 7 per cent. became pregnant. The difficult part of all these reports is that we do not know what cases became pregnant. No one has the slightest doubt that a case where one healthy ovary and the tube is left behind may become pregnant. It is in the more complicated cases that we question the probability of pregnancy. Dudley reports six cases of intrauterine ovarian grafting. All these cases continued to menstruate, but no pregnancies occurred. In these intrauterine grafting cases he always left the ovary attached to its ligament. At a meeting of the British Gynecological Society Dr. McN. Jones reported that he had in one case removed an ovarian cyst the size of an orange and resected from the other ovary a much smaller cyst and punctured others in the remaining tissue. Two years later he was compelled to operate upon the side where the portion of ovary was left, removing a cystically degenerated ovary, two cysts of the broad ligament, and a distended tube. He operated upon another for a left hydrosalpinx. Both ovaries appeared to be healthy except for the appearance of several small cysts, which were punctured. Five years later this patient was operated upon, removing a large hydrosalpinx and a medium-sized ovarian cyst. The left ovary was found covered with adhesions binding it to the stump of the tube. At the same time he had under observation three cases which required operation after previous conservative operations. He remarks that there must always be a large proportion of cases in which the removal of both adnexa is indicated. Cystic and other tumors, pus cavities, and sacs immediately determine this. If examination of the adnexa of one side shows them to be healthy there can be no question of their removal. He then takes up the question of the wisdom of complete extirpation of the diseased adnexa, where partial disease of tube or ovary affects one or both sides. He takes the ground that no one should remove the entire adnexa where such operations as ovarian resection or salpingostomy offer a reasonable hope that a cure may be effected, this applying to simple cystic states, small blood cysts

localized suppurative foci in the ovary, or localized and circumscribed distention and stricture of the tube. Finally he advises that if the adnexa of one side absolutely demand removal and the others show a diseased state, and if the patients consent be obtained after a full explanation of the consequences, the operation may be made complete.

Burrhage (*Med. News*, Apr. 13, 1901) reports 156 conservative operations, of which 100 had been under observation for at least one year. Three patients out of 156 died as an immediate result of operation. Symptomatic cure was effected in 73 out of 100 cases, 27 being unrelieved. Anatomical cure was effected, that is, ovaries and tubes were well placed and appeared normal to touch in 44 out of 69 cases, or 64 per cent. The others showed some enlargement or prolapse of ovaries or tubes. Pregnancy followed operation in 19 cases. Pregnancy resulted in no cases where both tubes were closed as a result of disease and resection done at the time of operation. According to a careful consideration of all factors bearing upon the subject, 32.7 per cent. of those for whom it was possible became pregnant. He reports one case where pregnancy twice followed the removal of both tubes and one ovary, the operation having been performed for ectopic gestation. He was unable to find and remove the ovary. There having been a salpingitis on both sides, the removal of the tubes was most thorough.

The literature contains several very extraordinary reports of cases where, after removal of both tubes and ovaries, pregnancy occurred. My conclusion in regard to such cases is that the men who made such reports had not done their work as thoroughly as they thought.

Except for the work of Kahn of Paris, in 1901, upon conservative operations upon the adnexa, which gives a most complete résumé of the literature and origin of this work in Germany and France, there is a remarkable dearth of literature. What does exist is practically useless for drawing conclusions with the exception of short articles by one or two men. The title of Kahn's work is "*Opérations Conservatrices de la Trompe*." He reaches the following conclusions: Conservative operations on tubes should be made exceptions, and are not to be considered except in cases of young women. Indications for conservative operation on the tubes are based partly on the condition of the tubes and partly on that of the ovaries. No conservative operation on tubes is justified unless at least one ovary is healthy.

In the present state of knowledge it is impossible to give exact indications for conservation of tubes. Tubes should be preserved when permeable, after being freed from adhesions. Where sacs exist and it is possible, he advocates resection of the tube above the point of the sac. In some cases of hydrosalpinx, hematosalpinx and some few cases of pyosalpinx there may be no danger in performing resection. Salpingostomy, however, is reserved for mild catarrhal cases. He reaches the conclusion, which varies very much from that of others, that gonococcal lesions are those which offer the best prognosis in conservative surgery of the tubes. Finally, he takes up the question how many patients become pregnant after these conservative operations where both tubes have been resected, quoting the following reports: Martin, 2; Schatz, 1; Mackenrodt, 3; Gesvins, 4; Polk, 1; Baer, 1; McMonagle, 1; Gersuny, 1; Riccard, 2; Delnet, 1; La Guan, 1; Richelot, 1. Burrhage recorded one case and Dr. Dudley, I believe, reported two in the whole list of his own cases. I have been unable to find any report of pregnancy after operation for double pyosalpinx. This means that only 12 or 13 cases of pregnancy have occurred, so far as we know, after complete or partial resection of both tubes. I leave out those peculiar cases that I have mentioned, where the men state that they have removed both tubes and ovaries, because it appears that those cases are mistakes. They are simple cases of resection of a tube, where pregnancy occurs from a bit of ovary left by accident.

Dr. Dudley's last paper is his most extensive article, and practically embraces the most important work of his life. He gives an analysis of 2168 cases of conservative surgery on the tubes and ovaries, 269 of which were his own. The average age was under thirty years. There were 269 pregnancies, that is, not quite 10 per cent. became pregnant.

We may conveniently divide this work into: first, a consideration of conservative work where neoplasms are present; second, where inflammatory, non-septic conditions exist; and third, where inflammatory and septic conditions exist. The subject of neoplasms may be further divided according as they are benign or malignant. The whole question of conservative surgery hinges largely upon the special condition and age of the patient. We do not need surgery of this kind in women who have passed the menopause. My belief is that where a woman has a benign tumor of one ovary, we ought to take out

the whole of the ovary. In the case of a woman past the menopause upon whom I operated about six or eight years ago, I removed a cyst from one side and left a little atrophied ovary on the other. Within less than one year that woman was brought to me with a cyst as large as an orange in the ovary which had appeared healthy. There was no reason why I should not have removed that ovary, because she had passed the menopause. If a neoplasm is present in a woman who has passed the menopause I would unhesitatingly remove both ovaries.

If a woman desires to have something done for sterility and perhaps is not suffering any symptoms, and a condition is found which is interfering with fecundation, one is justified, after laying the matter before her, in doing one or more conservative operations. We must, however, determine in such a case whether we are justified in resecting both tubes if they are closed, for the purpose of giving relief for sterility. In such women, if I find one ovary the site of a benign growth, I remove this whole ovary. I believe that wherever an ovary is the site of a true neoplasm the whole organ should be removed. If the woman had a neoplasm of considerable size on one side and a small one on the other I should be inclined to leave a part of the less involved ovary and take the chance of a second operation.

If carcinoma of an ovary exists, I believe it is well to remove both ovaries and the uterus and broad ligaments as far as possible, because malignant disease is extremely apt to recur. I make an exception of papillomatous ovarian cysts, because here oftentimes the malignant growth is so distinctly limited as to allow of its complete removal.

As to the question of removing or leaving the ovaries behind when we operate upon double pyosalpinx, I feel that wherever we can leave a healthy ovary under these circumstances it is well to do it. In hysterectomy for fibromyoma I believe in leaving the ovaries. Tuffier, as well as Pozzi, has never seen any evil come from this. I also have never seen any bad results from it, and I have observed that these patients are much more comfortable after the operation than those from whom the ovaries are removed.

Dr. Dudley, in describing the technique of his operations, made some extremely valuable suggestions. He says that he never uses catgut in sewing up ovaries because catgut requires a needle which he considers much too coarse for that work. He

uses silk with a fine cambric needle, so as not to leave any space for the possible development of a collection of blood. In those cases where the tube has contained pus he washes it out with a syringe with a moderately strong antiseptic solution and protects all the surrounding parts with gauze pads before doing the plastic work.

EFFECT OF SURGICAL OPERATIONS ON THOSE INSANE.*

BY

LEROY BROUN, M.D.

At the meeting of the British Medical Association, held in Montreal in 1897, Rohe, Superintendent of the Second Hospital for the Insane of Maryland, and Hobbs of the London Ontario Insane Hospital, each brought before the association papers constituting a report of the surgical work done in the two hospitals.

The claims of these two authors were promptly questioned by other alienists present, chief among whom was Russell, superintendent of the Hamilton Insane Hospital of Canada. He brought in support of his objections to surgery as a curative measure in insanity the opinions of 120 alienists of America and Canada with whom he had corresponded on the subject.

Shortly after Angellucci and Pierraccini, two Italian alienists, wrote an exhaustive thesis in opposition to the claims of Rohe and Hobbs.

Rohe in his paper reported 34 abdominal sections, in 32 of which the tubes and ovaries were removed from patients in whom the mental disturbance was accentuated during menstruation, and in whom at that epoch erotic and lascivious desires predominated. The presence of a disease of the ovary was not necessary for its removal. He reported 11 cases of mental cure.

A year previous to Rohe's paper, Kraemer, in an article appearing in the *Zeitschrift für Psychiatrie*, 1896, brought together 300 cases of castration in women for insanity, in which he claimed that seventy per cent. had been benefited. Hobbs in his paper before the association reported 80 gynecological operations, with 30 mental cures.

The operations of Hobbs seem to have been regulated more by

*Read before the Section of General Medicine of the New York Academy of Medicine, February 20, 1906.

the diseased condition present, though the presence of cystic condition of the ovaries was a sufficient cause for their removal.

Within the last ten years the opinions of alienists and surgeons have reached a common plane. The alienists almost universally now recognize the importance of rectifying and repairing pathological states existing among insane patients under their charge, whenever such a procedure will improve the physical and nervous health of the individual.

The surgeon recognizes that no operations should be performed except to rectify conditions disturbing the patient's physical well-being or endangering the life of the individual. Such a common ground has been reached largely through the writings of Manton, who for twenty-five years has been operating in the East Michigan Insane Hospital.

An examination of the records of various insane hospitals shows that at least seventy-five per cent. of the female patients have some form of pelvic or abdominal disease. The character of such diseases varies from that of a more trivial kind, from which few symptoms can arise, to that of a grave nature.

These patients have a right to be relieved of any physical suffering arising from such pathological conditions. The fact that they are insane should have no bearing upon giving relief, except in so far as their mental state should preclude for the time any surgical operation. It is in this spirit that all operations done under my direction have been performed. The physical status alone has been considered, and the relief of their physical and reflex nervous disturbances has been the object of my work. While this has been our primary object, the subsequent histories of such patients have been closely noted with a desire to determine, if possible, whether such a physical and nervous restoration could exercise a favorable influence upon the mental status for which the patient was confined in the hospital, and for which she was receiving the classical treatment for such conditions.

The author's surgical work having been largely among the women of the Manhattan State Hospital, his remarks will be confined to abdominal and pelvic surgery among these patients. During the three years ending October 1, 1903, 312 patients have been operated on, which is less than five per cent. of the female population of the hospital during that period. Of this number there have been 83 abdominal sections for various pelvic and abdominal diseases, and 229 operations of other character, chiefly plastic.

Somatic Improvement.—Of the entire number of patients operated on (312), 158 have been physically benefited in a marked degree. One hundred and thirty-one have been noticeably improved, but not to the extent of the previous class. Of the remaining patients 6 have died, 3 from natural causes and 3 attributable to the operation. Since the possibility of affording a physical relief has alone been our guide in offering operations, many of those operated on were sufferers from mental diseases known as giving little hope for a favorable outcome. The unfortunates of this class had, however, as much a claim to be made more comfortable as those of more amenable forms of mental disease.

Of the entire number operated on, 52 have been discharged from the hospital as mentally recovered. Of these, 23 showed a more rapid mental improvement under the recognized hospital treatment after the operation had been performed than before it was done. The improved physical health of the patient resulting from the operations permitted them to receive the full benefits of the regular treatment directed to their mental state.

The character of mental alienation present in the 23 patients whose recovery was due, in a large measure, to the improved physical health resulting from the surgical operations was: Melancholia, chronic, 7 patients; melancholia, acute, 7 patients; mania, acute, 5 patients; dementia, primary, 4 patients.

It is seen that the psychosis in all of these patients was such as could be accentuated by the presence of pathological conditions. It has been stated occasionally by some authors that surgical operations exercised a detrimental effect upon the psychoses of insane patients, at times changing a mild insanity to one of a more active and pronounced type. This general opinion gained credence by the unadvised efforts of some to benefit these patients by producing a premature menopause, and unquestionably much harm was done. Such a procedure is now unreservedly condemned by surgeons and alienists.

The secretions of the normal ovary are necessary to the general physical health and nervous equilibrium of the woman who is free from insanity. Their removal in such instances brings about distressing symptoms familiar to all gynecological surgeons. How much more important is it that in those whose nervous equilibrium is already destroyed, a superadded cause for further disturbances should be spared them! The evidence from the medical literature gives frequent instances of what were mild types of insanity being changed to one of a rapidly progressive type by such uncalled-for

removals. When, however, the ovaries are the seat of disease, nature has been already prepared by the lack of normal secretion and their removal adds to, instead of destroying, the nervous balance and physical health of the patient. In my entire range of operations on the insane there has been no instance in which a patient's mental condition has been aggravated by a proper surgical procedure. Manton, who has been operating in the East Michigan Insane Hospital for a quarter of a century, makes the same statement, and so does Piqué, who has been operating for twelve years as surgeon to the Department of the Seine (including four large hospitals in and around Paris). In the mental disturbances resulting from septic infection we can uniformly look for excellent results and steady mental improvement as a sequence of the relief of the septic condition.

Of the eighty-three abdominal sections for various conditions twelve per cent. were among those who were discharged as mentally cured from the hospital. Among these nine patients it was necessary to remove both adnexa in only two instances. These operations were as follows:

Two myomectomies, with suspensions of uterus.

Three suspensions of uterus for adherent uteri.

Two supravaginal hysterectomies.

One ovarian cyst.

One Bassini operation for hernia.

Of the 229 minor operations fourteen patients were among those discharged as cured, or about six per cent. This greater percentage of mental improvements following major operations I do not attribute to any cause other than that the pathological conditions demanding these operations gave rise to a greater disturbance of the physical health of the patients than those calling for surgery of a minor character, and in proportion as the physical health of the patient was improved, so was her ability to be benefited by the special treatment directed to her mental state increased. I am strongly in accord with the opinion expressed by Tomlinson that the mental benefit accruing is not dependent on the character of operation done, but more upon the nervous potentiality of the individual patient and her ability to respond to the stimulus of increased physical health. It matters not by what character of operation or by what other means the physical well-being is restored.

It is only on this ground that we can explain why one patient with a given character of alienation will improve under well-recog-

nized treatment, and another with a similar mental condition and under similar treatment fails to respond to the alienist's best efforts. Together with the nervous potentiality of each individual, which can be determined only by trial, there is another factor entering largely into the recovery or non-recovery of the insane. I refer to well-directed early treatment. It is a fact well recognized by alienists that the greatest percentage of recoveries takes place within the first year of the mental disturbance. After this the habit becomes more fixed and the outlook is not bright.

It is therefore of much importance that the physical health of the patient should be brought to its highest state of perfection at as early a period as is possible after the mental break-down. If any pathological states exist that can give rise to a physical disturbance, such should be rectified in order that the patient should receive the full benefit of the treatment directed to her mental recovery.

In closing, I regard that there are some facts we can feel are well established.

1. If the operation, when needed, has been properly done and the patient is not mutilated by an uncalled-for castration, the mental condition is never exaggerated.

2. Under the stimulus of the improved somatic state resulting from surgical relief and hygienic treatment, some of the patients show greater mental changes under the moral and therapeutic care than was shown before such relief was given.

At times this improved mental state continues to one of recovery.

The primary object of surgical operations upon the insane should be to improve the physical status of the patient with one end only in view—of relieving them of physical suffering and nervous disturbances. If as a result of this relief they are mentally improved it is a sequel welcomed, and for which the surgeon feels doubly repaid.

TRANSACTIONS OF THE AMERICAN GYNECOLOGICAL SOCIETY.

*Thirty-first Annual Meeting, Held at Hot Springs, Virginia,
May 22, 23, and 24, 1906.*

THE Society met in the Club House of The Homestead Hotel at 11 A.M., and was called to order by the President, DR. RICHARD B. MAURY, of Memphis, Tenn.

Addresses of welcome were delivered by DR. GUY HINSDALE, of Hot Springs, and by DR. A. H. BUCKMASTER, of Charlottesville, Virginia, which were responded to by DR. MATTHEW D. MANN, of Buffalo, N. Y.

GYNECOLOGY AGAINST OVERDONE AND MISAPPLIED SURGERY.

DR. E. C. GEHRUNG, of St. Louis, Mo., read a paper on this subject. He said that many years ago, when gynecology was in its glory as a benefactress to mankind, it gave rise to pelvic and abdominal surgery as a necessary complement. Soon general surgery absorbed the pelvic and abdominal surgery, and in the false hope that all the diseases of women could be brought under its domain, endeavored to ignore and finally to deny existence to gynecology. Not only had surgery failed in fulfilling some of its promises and for many years had, unchallenged, committed a great deal and much to be regretted harm by these attempts, but it had nearly succeeded in the accomplishment of its great wish to exterminate gynecology; it had only succeeded in debasing and depraving this most useful and necessary specialty.

Nobody held the great and wonderful achievements of surgery in greater esteem than the author. He wished it distinctly understood that his remarks did not apply in any derogatory way to this noble art and science, but only to the errors committed in the desire to accomplish too much. The mistaken idea was that all diseases that human flesh is heir to should or could be cured by surgery and by it alone.

As with all such unjust and overenthusiastic moves, the pendulum had swung too far, and according to the laws of nature had to begin its return. He appealed to the members against that unnecessary, if not criminal, surgery that had been and was still being practised in the cases that could not be benefited by the knife and others that could be at least as well or better treated by other means. In many of these latter the knife might obtain a quicker and perhaps just as good result, yet at the cost of mutilation. Many surgeons, after cooling of their enthusiasm, had become aware that they had gone too far and had begun to look for a way out of their dilemma

The author said it would lead him too far to consider or review all that was left of or had been added to gynecology during these years of its retirement. He confined his remarks to the mechanical part of it, and more especially to that most dishonored, most absolutely ignored part called forward displacements of the uterus, etc. All uterine displacements should be considered in the light of ptoses and herniæ. In fact, they were ptoses and herniæ and caused the symptoms of both in addition to their own. When the keystone between the pelvis and abdomen was displaced abdominal ptoses must follow; they might be minor enteroptoses only or might extend to the kidney and other abdominal organs, and thus produce symptoms for which the simple uterine displacement would not account satisfactorily. The replacement of the pelvic organs frequently relieved the ptoses, at least their symptoms. Backward displacements had not been forgotten, because they were the glory of the surgeon. Their treatment by supports, however, had much more completely fallen into desuetude, if he might reason from the small number practising and their imperfect way of handling them, as also their imperfect knowledge that appeared to have survived the cataclysm of gynecology. If the Alexander operation should not be done when there were adhesions, it was exceedingly questionable whether it should be done at all.

The situation concerning forward displacements was altogether different. Since anatomists said that anteversion and anteflexion were the normal positions of the uterus, and the pathologist denied pathological effects to antedisplacements, the practitioner was only too happy to ignore a state of affairs for which the means of relief were apparently so imperfect and so difficult of application, with so little or no results in prospect. The surgeon who occasionally recognized it and found, despite his ingenuity, that little if any benefit could be obtained by operations, was also willing to add his testimony to the non-existence of pathological antedisplacements. Although standing nearly alone, the writer claimed that forward displacements existed in a large number of cases, giving rise to many otherwise unrecognized troubles. He believed that they could be cured; that we had the means, and that they could easily be used by any physician or surgeon who would take the trouble to learn how. Many of these displacements recovered within a comparatively short time, while in others the support (pessary) had to be worn a long time, in some instances for years. The wearing of the pessary might be considered as much a cure as the wearing of a cicatrix or other mutilation.

The author said he had improved and simplified the mechanical division of gynecology to such an extent that anybody who had any mechanical ingenuity could easily learn to practise it. He had obtained beautiful results in the relief and cure of symptoms and diseases which had been declared utterly incurable by many eminent gynecologists, both in Europe and

America. Constipation, cystocele, complete procidentia with enterocele and of long duration (one case of forty-one years) had been completely cured. This was true not only with ante-displacements, but with retrodisplacements also his results had been extremely satisfactory.

A careful differential diagnosis between gynecological and surgical cases was of prime importance.

The author said that gynecology should be revived by practice and teaching as a legitimate, honest and honorable branch of the healing art, as there was an immense field for it; especially if practised in conjunction with the noble art and science of surgery and the collateral sciences. If his premises were correct, then all the unnecessary and wrongful surgery should be abolished as quickly as possible and gynecology substituted in its place, so that a woman might have the opportunity to get sick and well again without necessarily undergoing one or several operations.

DR. GEORGE M. EDEBOHLS, of New York, said the sum and substance of the paper centered around the treatment of anteversion and what could be done without operation. His views in regard to anteversion and anteflexion of the uterus had undergone radical changes since he began the practice of gynecology. Whenever he found on examination that the uterus was anteverted or anteflexed, it led him to suspect that he had to deal with excessive mobility of the uterus. In other words, it was the therapeutic equivalent of retroversion of the uterus, and he treated it like a case of retroversion where the uterus was flexible, or unattached, by shortening the round ligaments, and invariably his efforts were followed by success. It had long been known that shortening of the round ligaments cured cases of anteversion, but the explanation of it came only with time and increased experience.

DR. J. RIDDLE GOFFE, of New York, expressed himself as having been convinced for many years that anteversion was a normal position of the uterus, and he had taught that anteversion should be stricken out of the list of pathological positions of the fundus of the uterus. He had been doing this for a number of years, and did not find in later years any occasion whatever to interfere with a fundus that lay well to the front. He believed the symptoms of which many patients complained could be accounted for by other conditions than that of the position of the fundus, and he invariably found some pathological condition to account for the symptoms. He did not try to manipulate the fundus in any way with the view of fixing it, nor interfere with its mobility.

As to anteflexion, he regarded it in a different light, and expressed the belief that the anteflexed uterus was, as a rule, unless the flexion was acquired, an undeveloped uterus, and he treated it by improving its nutrition, by stimulating its circulation and developing the organ. If the case was one of acquired anteflexion, he treated it very much in the same way, but did not

interfere with it surgically by shortening its ligaments, or by attaching the fundus to abnormal tissue.

ENTEROPTOSIS.

DR. RICHARD R. SMITH, of Grand Rapids, Mich., in a paper on this subject reviewed the literature at considerable length, and said that a paper on this subject presented to a gynecological society would hardly seem complete without some reference to its relationship to pelvic pathology. The subject was of especial importance to the gynecologist since the majority of the patients that came to him for relief showed more or less signs of this condition. Out of one hundred patients examined Mathes found but seventeen who did not show distinct evidence of it. It might form merely the background of the picture which he had before him, or it might be the complete picture without other pathology. At any rate, its frequent occurrence and great importance should be borne in mind in every examination that was made. To gauge the exact relationship was often a very difficult matter. It was made all the more so when there was present a marked neurasthenia. It could be practically left out of consideration as far as treatment went in patients presenting neoplasms or pelvic inflammatory diseases. It was, however, of great importance in considering the lacerations, the various displacements of the uterus, as well as that large class of patients presenting pelvic symptoms with slight or undemonstrable lesion. One should consider the matter of operation in such cases with great care, and he must be guarded in his prognosis. Above all, in case operation was done, it was very necessary that a proper course of treatment be carried out afterward, if one expected to get results. It was known that enteroptosis and fair health were not incompatible. The enteroptosis might even be of a decided degree and still the woman go through life comfortably and accomplish her work. It was well to bear in mind, however, that these women as a class did not bear the ordinary exigencies of life as well as more vigorous women. Care, excitement, grief, child-bearing, too much work, too little recreation and rest, all were liable to affect her and were usually the immediate cause of her suffering. As a rule, these patients were conscientious and care-taking, their ambition greater than their strength.

The treatment of enteroptosis should really begin in childhood, and it meant all that proper hygiene could do for children. The out-door life, the exercise and school work should be carefully balanced. A child should be encouraged in the various sports, especially those which develop the chest and muscles of the trunk. Mathes had laid great stress on the development of the chest in this affection, and had not exaggerated its importance. If a woman came already suffering from the symptoms which were often enumerated, it was sometimes best to put her immediately to bed. The author gave an abundant,

easily digested diet, massage, and met any necessary indications as to the bowels and digestion. Pain usually decreased rapidly under this plan.

Following childbirth great care should be given a woman to see that the care and nursing of her child were not preventing a proper recovery of tissue tone. Practically, this was often very hard to carry out, but the importance of the matter should be carefully explained and every effort made to see that the woman had proper care. Maillart ascribed a most happy influence to child-bearing in such patients when properly guarded.

The author emphasized the great good that could be obtained from an out-door life. He advised many of them practically as he would a patient suffering from tuberculosis. A life entirely in the open air, with forced feeding, would do more for these patients than anything of which he knew. If the abdomen was prominent or very flabby, and especially if the patient had a general abdominal tenderness, which was so often present in bad cases, and more especially if he found that by standing behind her and placing the hands over the lower abdomen (the patient standing) and lifting up, relief was obtained, he advised a well-fitting abdominal bandage. This sign called by Glenard "*épreuve de sangle*," might also be used in the determination of the nature of the pain. If the patient was young, the thorax more or less mobile, he had often given a system of breathing exercises with the idea of increasing the lung capacity and the size of the upper abdomen.

DR. CHARLES P. NOBLE, of Philadelphia, thought it was a mistake to teach that all patients who had loose kidneys had enteroptosis. It was only in a minority of cases that a loose kidney was complicated with enteroptosis. It was true, many patients who had enteroptosis also had loose kidneys. But the converse, in his judgment, was not true. He had seen a few cases of loose kidney which were due to traumatism, but the number was very small. The great majority of women who had loose kidneys were unmarried; therefore the question of child-bearing was a very small factor in these subjects. It had much more to do with enteroptosis by causing a flaccid condition of the abdominal muscles; but so far as the kidney was concerned, it was a small factor.

His experience was not large in dealing with these cases in a surgical way, but he had operated on a number of them, and the operation devised by Dr. Beyea, of Philadelphia, supplemented by a method recommended by another gentleman, whose name he could not recall, would satisfactorily take care of these cases of drop stomach. He recalled three cases he had operated on with satisfactory results.

DR. MATTHEW D. MANN, of Buffalo, N. Y., believed there were causes which had not been referred to, but which were very important. One of them was dress. The all-pervading style among civilized women of constricting the waist line was an important causal factor. The universality of this mode of

dress had a great deal to do with the condition mentioned, as it was more commonly found in women than in men. Of course, men who wore tight belts, like blacksmiths, and men who constricted their waists with bands, were the subjects of enteroptosis. With regard to women, however, it could be easily demonstrated that they had very little movement at the waist line, not more, perhaps, than one-quarter of an inch. This constriction interfered materially with the physical development of women. He had seen corsets put on girls four and five years of age, and particularly on girls of twelve and fourteen years of age. When corsets were worn at this age the thorax could never be of the proper shape; the abdominal muscles lacked supportive power, and the contents of the abdomen would be forced down into an abnormal position.

He had not been satisfied with operative procedures for the relief of these conditions. He did not think we were in a very good position to treat, surgically, this condition, which caused so much discomfort.

DR. JOHN G. CLARK, of Philadelphia, had studied these cases closely in the last three or four years. He had had twenty-one cases of various ptoses of the viscera, chief among which had been ptosis of the transverse colon, especially of the sigmoid flexure. He recalled several cases of ptosis of the sigmoid flexure, where a loop of bowel had been caught, in which there were alternating constipation and diarrhea, the patient going three or four or five days before the bowels would move, and then possibly there would be a copious diarrhea. Dr. Clark demonstrated a method which he had practised for the relief of this condition. As to the etiology, his own feeling was that in many of these cases inattention to the bowels was one material factor.

DR. J. RIDDLE GOFFE asked what percentage of these cases came to operation.

DR. CLARK replied, a very small percentage, as medical men relieved a great majority of them.

DR. J. CLIFTON EDGAR, of New York, called attention to the too early getting up of women after confinement as a causal factor of enteroptoses. Women, when they got up too early after confinement, complained of stomach trouble and drifted into the hands of stomach specialists, who would find dropping of the stomach or intestines, yet they did not complain before. Such women were prone to attribute their discomfort to uterine trouble, to uterine displacements, perhaps. Constipation, alternating with relaxation of the bowels, produced by the constant administration of cathartics given during pregnancy, was one of many causal factors. There was a faulty involution of the intestinal supports. Involution of the abdomen, so to speak, should be complete before a woman got up after confinement. It took time for this to occur. There were many factors in prophylaxis. Massage was a valuable means. Per-

sonally, he believed in women wearing an abdominal support for three months after confinement, especially primiparæ.

DR. J. RIDDLE GOFFE, in referring to a corset as a part of women's dress, said he believed the old-fashioned straight-front corset was an improvement over those that were worn. He thought it was a beneficial garment for women. Instead of using abdominal supports, as was formerly his custom after laparotomies, he put the woman in a straight-front corset which was carefully made by a woman who carried out his idea. This corset supported the abdomen admirably. Women liked it very much and some of them continued to wear it for years. He had also recommended this corset to be worn by women with pendulous abdomens. He reported two cases of gastroptosis which were relieved by operative measures.

DR. SMITH, in closing the discussion, said a tight corset would exaggerate such conditions as he had referred to; but it must be remembered that enteroptosis was not due to the wearing of a tight corset, nor to tight lacing, for this condition was quite common in Arabian women.

THROMBOSIS AND EMBOLISM FOLLOWING ABDOMINAL OPERATIONS.

DR. JOSEPH TABER JOHNSON, of Washington, D. C., in a paper on this subject directed attention to one of the unexpected occurrences, not exactly an accident, which unfortunately followed a certain small percentage of abdominal operations, and which fortunately had more to do with their morbidity than with their mortality. He referred to those cases of thrombosis, chiefly of the femoral vein, from which an embolus was occasionally detached, and which might, and sometimes did, cause a fatal pulmonary, cardiac or cerebral embolism. These conditions were not, as a rule, preventable, while they were known to follow more frequently in the wake of supravaginal hysterectomies for the removal of uterine fibromas than of any other abdominal operation, with the possible exception of uterine suspension for the relief of retrodisplacement of the uterus. Femoral venous thrombosis might occur during convalescence from perfectly aseptic minor gynecological operations, such as those upon the cervix uteri, vagina or perineum, and it had been reported also as a sequel of typhoid fever, pneumonia and influenza.

The author referred at length to the literature of cases of thrombosis and embolism following abdominal operations, and then discussed the etiology. He said there were two opinions held at present which were directly opposed to each other. According to the first opinion, the lesion started as a phlebitis due to infection at the time of the operation; while the second theory regarded thrombosis as due to traumatism, as a primary lesion, which in turn was responsible for the inflammation of the vein. Those who adopted traumatism as a causative factor sustained their theory by reporting a series of operations in

which a larger proportion of the perfectly aseptic cases had femoral thrombophlebitis than occurred in those previously infected.

Clark made the contention that injury to the epigastric veins by retractors holding open the abdominal incision during protracted operations, was the cause of the trouble, and as proof he drew attention to his forty-one cases in which he insisted that infection could not have been the cause, inasmuch as in his long series of cases septic operations were not as frequently followed by phlebitis as were the aseptic ones.

In the author's series of eight cases there was infection at the time of the operation in only one that was noticeable, at least by the usual symptoms, and no other characteristic evidence of the condition developed up to the time of the development of the thrombosis.

The author's own view of the causation in previously non-septic cases was partly that of Davis and partly of Clark, namely, that the mechanical violence to the walls of the vessels which occurred at the site of the operation, and by the use of retractors, started up an inflammatory process which gradually extended to the femoral vein, where thrombosis resulted in a certain inexplorable number of cases. Were traumatism the only cause, one might expect postoperative femoral thrombophlebitis in nearly all cases of difficult pelvic surgery. Were a pre-existing infection the chief cause, or infection introduced by the surgeon at the time of operation, one might naturally expect phlebitis to follow in nearly all septic cases. Whereas it had been shown by Clark and others that exactly the opposite conditions most frequently prevailed.

That infection played a certain rôle in the causation of some cases of femoral thrombosis was evident from its occurrence during typhoid fever, influenza and other infectious diseases, such as pneumonia and post-partum infections. Steiner had reported forty-four cases of femoral thrombosis following pneumonia. The curious fact seemed to obtain that in a large proportion of these cases, no matter what the cause might be, the left leg was the one most frequently affected.

The anatomical theory insisted on by Clark and supported by Welch and Recklinghausen suggested a very plausible explanation. The epigastric veins, so frequently mechanically interfered with by the retractors in use during most abdominal sections, entered the femoral vein at an obtuse angle to the blood current, thus giving rise to an eddying motion of the blood, which Recklinghausen advanced as a most favorable condition for the formation of a thrombosis.

While fatal pulmonary embolism occurred as a rule much earlier than femoral thrombophlebitis, they both made their appearance without preliminary symptoms, and practically rendered it impossible to pronounce a patient free from danger until at least a month had elapsed from any abdominal or pelvic operation, especially in women. Thrombophlebitis rarely showed

itself until after the end of the first week, and in some reported cases as late as the fourth week, and usually in the left leg.

In one of Bosher's cases it occurred on the thirty-second day after operation and in several after leaving the hospital. In Clark's series of cases the left leg was affected twenty-five times, the right leg eleven times, and both legs five times. In cases where the operation had been on the right side, the left leg was the one usually thrombosed. This was noticed in four of Clark's cases. In two cases reported by Willy Meyer the left leg was first affected, and upon its restoration the right one became involved. In four cases reported by Vander Veer the left leg alone was involved.

In the author's eight cases the left leg was affected first in each instance, while in two the right was subsequently attacked. In none did the trouble appear earlier than the second week, while in one fatal case, after apparent recovery, while the patient was getting ready to leave the hospital, very sudden pulmonary embolism came on, and she died in a few moments after the onset of symptoms.

There was little to be said in regard to the diagnosis, prophylaxis and treatment. Having their possible occurrence in mind after abdominal or pelvic operations, one should find no difficulty in differentiating it from rheumatism, neuralgia or any other complaint. Increased aseptic precautions might lessen their possibility on the theory of infectious causation, and greater care in the use of retractors, protecting the soft parts by gauze pads under these instruments, might lessen the danger of traumatism to the epigastric veins as suggested by Clark. Patients who had lost much blood or had been transfused might be kept a longer time more quietly in bed, with the unobstructed and easy venous return circulation facilitated by the elevation of the foot of the bed immediately after operation. The treatment, according to Bosher and others, was largely negative. Palpation was to be performed only when absolutely called for, and then with the greatest care, on account of the possibility of dislodging a portion of the thrombus and thereby causing pulmonary embolism. Complete rest in bed, elevation of the limb, enveloping the affected leg in cotton held in place by a lightly-applied bandage, would usually result in complete recovery in two or three weeks without suppuration. Some surgeons recommended the application of mercurial and belladonna ointments, but there was some doubt if the manipulation required in their use might not result in more harm than good. The patient should not be allowed to make much muscular effort for some time after the complete subsidence of all local symptoms. The wearing of an elastic stocking was recommended during convalescence as likely to give support to the vessels and add to the comfort of the patient.

POST-OPERATIVE EMBOLISM.

DR. EUGENE BOISE, of Grand Rapids, Mich., said that the pulmonary artery and its branches were affected in the great

majority of cases by embolism following operations. An embolus presupposed a thrombus. For the formation of a thrombus three elements were necessary, fibrinogen and calcium salts, which existed normally in the blood, and nucleoproteid, which was never found in normal blood. Nucleoproteid was formed by the degeneration of blood plates and leucocytes. Certain conditions of the blood and blood-vessels predisposed to thrombosis. Anemia or chlorosis, sepsis, excess of calcium salts, retardation of the rate of the blood current, traumatism, inflammation of the coats of vessels, pressure, etc. Conditions calling for operation often involved one or more of these conditions. Fibroid tumors, which showed the greatest percentage of post-operative emboli, were coincident with the excess of calcium salts in the blood and degeneration of the musculature of the heart, with consequent imperfect contractions, and residual blood, with the retardation of blood flow, predisposing to heart clot. Indications for treatment were mostly looking toward prevention. When pulmonary embolism occurred nothing was of much avail, except the administration of oxygen.

DR. CHARLES P. NOBLE, of Philadelphia, said of 7,130 women operated on in the Johns Hopkins Hospital, in 48 phlebitis occurred. As to the character of the operations, it occurred after perineorrhaphy, 4 times; after myomectomy, 19 times; after the removal of ovarian cystoma, 9 times; after hysterectomy for carcinoma, 5 times; after suspension of the uterus, 3 times; after suspensio uteri and perineorrhaphy, 4 times; after hysterectomy for pelvic inflammatory disease, once, and miscellaneous, 3 times. He had had embolism and phlebitis of the left crural vein twice after right nephrorrhaphies. He had had these conditions after hysterorrhaphy, after operations on the cervix, and perineum, and one of the worst cases he had ever seen was after hysterorrhaphy. He did not think that sepsis had much to do with the question.

DR. REUBEN PETERSON, of Ann Arbor, Michigan, said the mystery in the etiology of thrombosis and embolism made it doubly interesting. These conditions came on not only immediately after operation, but a month or six weeks afterward. He had a patient in the University hospital at present with an aggravated form of femoral thrombophlebitis which appeared in the third week after operation. The operation consisted in the removal of nonadherent, nonpurulent appendages. There was not enough sepsis connected with this case to warrant one in thinking that she would have any such conditions develop. During the third week she developed thrombophlebitis of the left side, of a severe type, which extended not only to the femoral region but also up over the buttocks. The swelling was very intense. Very soon a dark area appeared over the left femoral, and gradually this developed into a necrosis. Dr. Peterson exhibited a photograph showing the area of necrosis referred to.

He had taken statistics from this clinic for the last four and a half years, but these did not include the case mentioned. Of three thousand operations performed during these four and a half years at the University Hospital clinic, there were six cases of femoral thrombosis. There were one thousand and fifty women operated on. Of these six cases, three came for the removal of the appendages; one for hysterectomy for fibroids, although there were eighty or one hundred cases where fibroids were removed. One came for simple dilatation and curettement of the uterus. In one case the record was not available. The left femoral vein was affected four times, and in one case the left groin and the right leg were affected.

As regards its occurrence after operation, in one case it took place eleven days after operation; in two cases it occurred fourteen days after operation; in two cases nineteen days, and in one case twenty-one days.

DR. EDWARD REYNOLDS, of Boston, said that thrombosis had occurred most frequently, in his experience, in cases treated for the correction of retrodeviation of the uterus in which there had been a great deal of congestion before the operation. He was inclined to believe that thromboses were more frequent now than they were fifteen years ago. Operators were underestimating the importance of congestion in the production of symptoms of pelvic disease. There was a varicose condition developed in the broad ligaments. Fifteen years ago it was taught and believed that that was an important element in the production of symptoms in pelvic disease.

DR. ANDREW F. CURRIER, of New York, said the tendency of surgeons in these days to get their patients up in a hurry after the performance of serious operations had doubtless something to do with the production of phlebitis or thrombosis.

DR. S. C. GORDON, of Portland, Maine, agreed with Dr. Currier in what he had said, and expressed the belief that the too early getting up of patients after operation was causative of phlebitis.

DR. T. J. WATKINS, of Chicago, said evidence had been adduced to show that thromboses were in some cases due to infection. Thromboses were common in infectious diseases, even where there was no history of traumatism. They were common after typhoid fever. If statistics were worked up, he believed it would be found that thromboses were nearly as frequent after typhoid fever as after abdominal section.

DR. J. MONTGOMERY BALDY, of Philadelphia, said that while sepsis, pressure by retractors, traumatism of the pelvic veins, were possible causal factors, yet none of the explanations so far offered were sufficiently feasible in his judgment to explain a large number of cases.

The subject was further discussed by DR. LE ROY BROWN, New York; DR. JOHN G. CLARK, Philadelphia; DR. M. DÜHRSEN, Berlin; DR. GEORGE M. EDEBOHLS, New York; DR. RICHARD R. SMITH, Grand Rapids, Mich.; DR. RICHARD C.

NORRIS, Philadelphia; DR. HENRY P. NEWMAN, Chicago, all of whom reported interesting cases substantiating the observations of both the essayists.

SYMPOSIUM: DILATATION VERSUS INCISION OF THE PREGNANT (PARTURIENT) UTERUS.

(a) ARTIFICIAL DILATATION OF THE CERVIX UTERI; INDICATIONS AND METHOD.

DR. GEORGE TUCKER HARRISON, of New York, said that as indications for the artificial dilatation of the cervix might be cited in the first instance local morbid conditions which interfered to such an extent with the dilatability of the os uteri and cervix that the natural forces were inadequate to the end to be attained. In addition, direct danger to mother and child might furnish an indication for the artificial dilatation of the cervix, a danger only to be averted by a speedy delivery of the child. Of the local diseases, he mentioned those which made a rigid, unyielding condition of the cervix, as chronic inflammations, syphilitic induration, cancer, or hypertrophy of the infra- and supravaginal portions. Of the pathological conditions which demanded active interference in the interest of both mother and child to effect a speedy delivery, he mentioned eclampsia; prolapse of the umbilical cord, placenta prævia partialis; asphyxia of the fetus, and beginning sapremic intoxication consequent upon a dead fetus, or the retention of placental parts. Furthermore, the premature detachment of the placenta attended by internal or external hemorrhage was a grave and dangerous accident that demanded a prompt delivery. Again, artificial dilatation was indicated when in an obstetric operation (forceps, version, perforation) the passage of the head or breech met with difficulty in consequence of insufficient dilatation of the os uteri. Finally, an indication was furnished in cases of transverse presentation with premature rupture of the membranes, when version, according to Braxton Hicks' method, was not yet possible; and also in certain cases of narrow pelvis, with the head at the brim, in order to perform the prophylactic version.

(b) DILATATION OF THE PARTURIENT UTERUS.

DR. PHILANDER A. HARRIS, of Paterson, New Jersey, discussed manual dilatation as it is practised by him. He also referred to instrumental dilatation as accomplished by his instruments.

In referring to manual dilatation he wished to be distinctly understood as referring to a method which he had employed for the past twenty-two years, and to no other method, unless such method is as rapid, as safe, and as certain in effect as that which he had used. The method of effecting manual

dilatation was first publicly described by him in a paper read at the Pan-American Medical Congress in 1893. By this method a far greater tonic strain could be applied upon the musculature of the cervical ring than by any other manual method. It was also far less fatiguing than other methods. It relied mainly upon the flexor muscles of the fingers and hands. Not all cervixes were dilatable. The growth of cancer in the cervix might render it undilatable. A cervix which had been partly cut away, and amputated and sewed, or reseeded, might contain so much white fibrous tissue that it was undilatable. The average time required to safely dilate the cervical ring to a circumference of eleven or twelve inches should be forty-five minutes. If the cervix was not effaced, the average time of ninety minutes would be necessary to safely dilate the cervical ring to a circumference of eleven or twelve inches. The special advantage of knowing how to manually dilate the cervix was that the operator always had his hands with him, and they would scarcely ever fail to dilate the cervix if properly employed.

The disadvantages of the method were the fatigue incident to the task, and that the frequent changing of hands from left to right, and from right to left was liable, of course, to carry into the vagina septic matter from the rectum or some unwashed area.

The advantages of instrumental dilatation as accomplished by the instrument presented were that it would dilate any cervix that was dilatable. It was easy of introduction. It did not have to be withdrawn and reintroduced over and over again, as would happen in the long operation when done by the hand. It was provided with a dynamometer, which showed not only the number of pounds of pressure which was being exerted upon the cervical ring, but also showed whether the ring was dilating under pressure. The instrument had a safety device so that extensive laceration could not occur if the instrument were properly used. Laceration, however, would rarely occur, except in the hands of impatient and unskillful operators. The instrument was made of steel and could be sterilized. As to the disadvantages, no one should employ it who had not previously and practically studied its behavior. A good deal of study was required to prepare one to safely use the instrument.

DR. WM. H. WATHEN, of Louisville, contributed a paper on

SURGERY OF THE GALL-BLADDER AND BILE DUCTS.

The symptoms of gallstones were so characteristic that an approximately correct diagnosis could usually be made. Gallstones were never dissolved or removed by internal medication, but the severity of the immediate symptoms might be modified by good hygiene and the use of such treatment as would tend to remove gastro-duodenal irritation and cholangitis.

When a diagnosis of gallstones had been made, an operation

for their removal was indicated, and as the mortality was practically nil when the operation was correctly performed before serious complications had developed, there should be no delay.

The gallstones claimed to have been passed from the gall-bladder or ducts, following the use of sweet oil were only *gall-stone ghosts*. As no internal remedy would dissolve gallstones, the internist must cease in his attempts to remove gallstones, and refer such cases to the surgeon.

If the gallstones were not removed serious or fatal complications might at any time supervene, such as cholecystitis—simple, phlegmonous or gangrenous,—catarrhal or septic cholangitis, pericholecystitis, perforation or ulceration of the gall-bladder or bile ducts into the peritoneal cavity or the intestine, or ulceration of the gallstones into the liver. With few exceptions, large gallstones that passed into the bowel did so by ulceration into the intestine, and not through the duct.

Drainage was indicated in operations for cholecystotomy and choledochotomy, and in many cases of cholecystectomy, and its necessity was imperative where one found inflammation of the gall-bladder, bile-ducts or pancreas, with or without obstruction of the common or hepatic ducts.

If the gall-bladder could be safely attached to the abdominal incision, it was only necessary to suture a long gum-tube into its cavity and drain the bile into a bottle by the side of the patient, thus avoiding soiling the dressing or changing it for about ten days. Where the gall-bladder could not be sutured to the abdominal incision, and in cases where the stones were removed from the common duct, in addition to the drainage through the tube into the opening, a split tube filled with gauze should be placed immediately under the first tube, so as to protect the patient against the possible danger of bile-leakage into the peritoneal cavity. The incision in the duct should never be sutured unless drainage was established through the gall-bladder with a patulous cystic duct. Cholecystenterostomy should never be employed except as a last resort when other means had failed or could not safely be utilized.

Cholecystendysis, or so-called ideal cholecystotomy, was in no sense ideal, was dangerous and nearly always contraindicated.

Cholecystotomy or choledochotomy and drainage would cure most cases, but cholecystectomy was indicated when the gall-bladder was thickened and seriously altered, was contracted in a cicatricial mass around gallstones, or was involved in carcinomatous degeneration; or when the cystic duct was so obstructed that drainage could not be re-established into the gall-bladder; also when the gall-bladder was gangrenous, and in many cases of phlegmonous cholecystitis.

In operations for gallstones, the cystic, common and hepatic ducts should be carefully examined to see that no gallstones were left to obstruct the free flow of bile into the duodenum. One should also examine the pancreas for duct-obstruction, pancreatitis, carcinoma, or tumors. Gallstones, or pancreatic con-

cretions in the ampulla of Vater were best removed by the trans-duodenal method, and chronic pancreatitis might be successfully treated by drainage through the gall-bladder or common duct.

With the Robson incision, by pulling down and rotating the liver, the direction of the cystic duct and common duct was practically in a direct line, thus enabling the surgeon to introduce a sound or scoop through the opening in the fundus of the gall-bladder into the duodenum.

By the use of the sand-bag under the back, and pulling down and rotating the liver, most operations for gallstones might be practically extraperitoneal, thus converting what was formerly a difficult operation into a simple one.

If one excluded a few delayed cases, where complications had arisen that surgery could not overcome, patients operated on for gallstones or inflammation of the gall-bladder would all recover without untoward symptoms unless there was an error in the operative technique, or faulty drainage. In many operations during the last three years at St. Anthony's Hospital, St. Edward's Hospital, and the Kentucky School of Medicine Hospital, the records showed that the writer had had no mortality. He had not refused to operate upon any patient, some of them badly jaundiced, others with a temperature from 102° to 105° .

ADVANTAGES OF BIMANUAL DILATATION OF THE PREGNANT AND PARTURIENT UTERUS.

DR. J. CLIFTON EDGAR, of New York, read a paper on this subject. To accomplish rapid delivery, he said, we had to-day vaginal and suprapubic Cesarean section, incision, and mechanical dilatation of the cervix. They all had their place in appropriate cases.

Clinically, he was accustomed to divide all cases calling for rapid delivery into (1) those in which the supravaginal cervix was dilated and drawn up into the lower uterine segment, the defective dilatation being confined mostly to the external os, and (2) those in which the cervix was unchanged and no preliminary dilatation had taken place.

In the first instance he could hardly conceive of a condition calling for incision of the uterus for purposes of dilatation, as skillful bimanual stretching would fulfil every requirement. The most difficult cases for artificial dilatation were those in which the cervix was unchanged and no preliminary dilatation had begun.

Previous to the introduction of the Bossi type of metal dilator, he incised a number of these cervixes by both superficial and deep incisions. Since its introduction he had cut very few cervixes. He considered the Bossi dilator a valuable addition to our resources, and its use justifiable. His experience had taught him, however, to reject the Bossi dilator as a means to complete dilatation. The instrument and its modifications were not shaped for the dilating cervix, as the ends of the blades could not be controlled,

and he had seen serious lacerations result from the use of the instrument in the last stages of dilatation. The dilating part of the instrument remained applied to the ring of the cervix. Clinically, it was apt to slip over the rim of the cervix and injure the uterine wall above the vaginal wall. Zweifel had observed four serious lacerations and one complete uterine rupture from its use.

An important advantage of manual dilatation of the uterus was that it at the same time dilated the vagina in preparation for the subsequent passage of the fetus. This could not be said of vaginal Cesarean section or of incision of the cervix. Vaginal Cesarean section, while it certainly was a competitor with mechanical dilatation in certain cases, must be used with care, and was applicable in only a relatively small proportion of cases.

He had in fifteen years' experience with bimanual dilatation one complete rupture of the uterus, in a case of placenta prævia. His records showed that in not more than three cases was it deemed necessary to suture the cervix subsequent to the dilatation.

The author said he had every confidence in the efficacy and safety of bimanual stretching of the cervical ring as a means of dilatation, when carefully and skillfully performed. Further, his experience led him to advocate strongly the use of the two hands for cervical dilatation. In his sixteen years' experience in five maternity hospitals, he had yet to meet an interne who, after having tried the two methods of cervical dilatation, namely, with one and with two hands, did not finally adopt the method requiring the use of the fingers of both hands, and for the following reasons: "(1) The bimanual method is a closer imitation of the natural process than any other method of manual dilatation, being in this respect analogous to the bag of membranes or the hydrostatic bag, because the force used for dilating the cervical ring is directed from above downward. (2) Far greater force can be brought to bear upon the cervical ring, if need be, by the bimanual method than by any other, because the fingers of both hands are brought into play and the stronger flexor muscles of the fingers and hands are the ones made use of. (3) There is no danger of prematurely rupturing the membranes, as there is when the fingers of one hand are passed through the cervix. (4) There is no interference with the original presentation or position, since the finger ends closely hug the lateral uterine wall. This cannot be said of any other manual method of dilatation, nor even by hydrostatic bags. (5) The bimanual method is far less fatiguing than any other method, because the strain is distributed in both hands, and the sense of touch of the operator's fingers is unimpaired, as there is no constriction of the hands as there is when one hand is used. (6) The amount of force exerted can be better estimated with two hands than with one, hence the danger of laceration is lessened. (7) In placenta prævia there is less separation of the placenta with the bimanual method than when the fingers of one hand are thrust through the ring of the os. (8) The

bimanual method can be performed while a part of the fetus, as a leg or after-coming head, already occupies the vagina. This advantage applies to no other method of manual dilatation, and is, in my opinion, its greatest recommendation."

VAGINAL CESAREAN SECTION.

DR. DÜHRSEN of Berlin, Germany, read a paper (by invitation) on this subject. The author stated that by means of vaginal Cesarean section and Gigli's hebotomy, a problem of centuries in obstetrics had been solved, namely, the problem of how, without danger, to deliver the mother of a living child in the presence of obstructions through the soft and bony parts of the generative passage, since neither of these operations had the dangers of the classical Cesarean section, nor of symphyseotomy. Both operations could be combined in one case, as, for instance, the case of a patient with a contracted pelvis, who was attacked with eclampsia before the dilatation of the os. The extremely simple subcutaneous hebotomy was first performed, and then the vaginal Cesarean section. In this way Henckel operated successfully on a case of placenta prævia with contracted pelvis. He said the combined operations were simpler and less dangerous than the classical Cesarean section, because in it there was always the danger of the uterus tearing in subsequent deliveries. This danger was excluded in vaginal Cesarean section. As proof of this assertion, he presented three photographs, which showed that the scar after a vaginal section was hardly visible. Also the eleven deliveries observed after vaginal Cesarean section ran an easy course, with one exception.

The fear of disturbances in labor, as expressed by Findley, of Chicago, was therefore without foundation. The author presented the following statements in rebuttal to Findley: (1) The delivery could be terminated in five minutes by the vaginal Cesarean section. (2) Asepsis by vaginal Cesarean section could be brought about in just as exact a manner as by the classical method. (3) The incisions of the vaginal Cesarean section did not tear further if the technique was carried out properly. (4) In only few instances was sterilization desirable. The uterus could be removed by the vagina after a vaginal Cesarean section as quickly as after an abdominal Cesarean section. (5) With the proper technique, the child was not endangered any more by the vaginal Cesarean section than by the classical method.

The indications for vaginal Cesarean section were summed up by the author as follows: Vaginal Cesarean section was indicated when, in the case of an imperfectly dilated cervix which would not permit of dilatation by gentler means, the life of the mother or the child was brought into danger. Also the presence of an operator experienced in vaginal gynecological operations was required. The imperfect dilatation of the cervix could be caused by pathological changes in the neighbor-

hood of the lower uterine segment, or danger to the mother and child might arise when the pains had as yet not caused sufficient opening of the os. In the first, the case was that of an absolute, in the second, that of a relative, obstruction to delivery. The first must be removed because it would lead to danger for the mother and child. In the second, the danger was already present and required the immediate emptying of the uterus.

Among the special indications, he mentioned eclampsia. He first established the principle that on account of the independent nature of eclampsia it was best, as soon as the diagnosis was made, to empty the uterus by means of deep narcosis. Investigations of the last few years had corroborated this.

In premature separation of a normally situated placenta, vaginal Cesarean section in his opinion was the recognized operation. In placenta previa he was inclined to empty the uterus by incision, as was first recommended in America, and he recommended vaginal instead of the classical Cesarean section. In any case, vaginal Cesarean section might be recommended for placenta prævia where the cervix did not possess sufficient dilatation and dilatibility for the performance of metreurysis, or where, as, for instance, in the case of an old primipara, or a full-term child, a great deal depended on the saving of the child.

The danger of vaginal Cesarean section was not greater than that of any other obstetrical operation. Indeed, he said that it was less than that of a forceps or a perforation operation in cases of imperfectly dilated soft parts. In these operations a great many injuries took place from tearing and crushing, which had a greater disposition toward septic or pyemic infection than the smooth incision wounds of the vaginal Cesarean section, and left unpleasant scars behind.

He repudiated the Bossi method entirely, saying that in cases of closed cervix it was dangerous, and in cases of dilatation of the supra-vaginal part of the cervix it was unnecessary because delivery could be more rapidly performed by deep cervical incisions or by vaginal Cesarean section.

He had collected 376 cases of vaginal Cesarean section, with forty-eight deaths. This high mortality was not due to the dangers of the operation, but to the serious diseases for which the operation was undertaken. This proved that the radical vaginal Cesarean section had a lower mortality than the conservative vaginal Cesarean section.

The author himself had had two deaths in twelve cases of vaginal Cesarean section. One was a woman who was moribund with heart disease. She died immediately after the uterus was emptied. The other was a case of eclampsia with pulmonary tuberculosis. She was first cured of the eclampsia; the wound healed perfectly, and the uterus was completely involuted, but she died in four weeks of tubercular pneumonia.

ON THE POSSIBILITY OF THE DEVELOPMENT OF CANCER IN THE CERVICAL STUMP FOLLOWING SUPRAVAGINAL HYSTERECTOMY.

Dr. Andrew F. Currier, of New York, said that the reason there had been so few reports of cancerous degeneration in the cervical stump, which remained after the removal of the corpus uteri by abdominal section, was in part, at least, the fact that the great majority of these cases were not heard from after they left the hands of those by whom the primary operation was performed. The cases in which this complication might arise were usually those in which the uterus had been removed for myoma. That myoma frequently coexisted with cancer was a matter of common observation.

Piquand had collected forty-five such cases, in twenty-four of which it was thought that the fibro-muscular elements had been transformed into epithelial cells, although in some of them there were preexisting cells which proliferated and developed malignancy. These cells were supposed to have been derived either from the embryonic remains of the Wölffian or Müllerian canal, or were simply epithelial ingrowths into the fibrous tissue. The author was satisfied from his own experience that the coexistence of cancer and myoma was much more frequent than Piquand would seem to think. Noble, in an analysis of 1,188 cases of fibroid tumors operated upon by various surgeons, found twenty-nine in which cancer of the corpus uteri was a complication, twelve in which there was cancer of the cervix, and one in which there was a cancerous infiltration of fibroid tumor arising from adeno-carcinoma of the corpus uteri by metaplasia. He believed the records of any institution in which large numbers of cases of cancer were seen would show a much greater number of coincidences of cancer and myoma than the statistics of Noble would indicate, and that the number associated with cancer of the cervix was much greater than the cancer of the body of the uterus. He had not yet seen any conclusive evidence that myoma was transformed into carcinoma, and histologically one would not expect such a sequence.

Of the cases appearing in the literature, the author added one which came under his observation. The patient was 51 years of age and was sent to him October 5, 1905, the corpus uteri, ovaries and tubes having been removed for uterine myomata March 23, 1901, by the late Dr. George R. Fowler, of Brooklyn. The patient recovered promptly from the operation, but subsequently developed cancer of the left breast, and this was removed by the same surgeon eighteen months after the first operation. Recovery from the second operation was also prompt, though she had complained of pain and numbness in her side and arm ever since. Dr. Currier dissected out the cervix from the vagina November 10, 1905, which was found well covered with thickened, firmly adherent peritoneum. The mucous membrane of the os uteri showed typical epithelioma

which had not proliferated to the surrounding structures, nor had the tissues broken down. The patient recovered promptly.

The suggestions which occurred to him in connection with the consideration of this subject were the following: (1) The necessity of more careful clinical and pathological records, both public and private, in all the cases in which supravaginal hysterectomy was performed. This would probably result in the discovery of cancer of the endometrium in cases in which it was not suspected, and would probably bring to light additional facts in regard to the history of the evolution of cancer. (2) The periodical examination of those who had undergone the operation in question at not longer than six months intervals. This was especially desirable for those whose tissues were in a bad condition of nutrition or who suffered from an hereditary taint. (3) Complete removal of the uterus offered greater security from cancer than the retention of the cervix. If the patient's history revealed any conditions which suggested the possibility, near or remote, of future degeneration of tissues, complete extirpation should be the invariable rule.

DILATATION VERSUS INCISION OF THE GRAVID UTERUS.

DR. EGBERT H. GRANDIN, of New York, in a paper which he contributed on this subject, and which was read by title, said that it must be considered from the standpoint of elective operation and from the standpoint of emergency operation. Incision should never be resorted to when the complication calling for intervention justified delay. Thus the induction of labor in case of pelvic contraction, interference in many cases of impending toxemia, as also in most cases of placenta prævia, called for dilatation. On the other hand, the acute toxemias, the urgent instances of placenta prævia called for incision. The operative methods to be considered were abdominal and vaginal incision, and manual and instrumental dilatation.

Broadly stated, in pelvic contraction, whenever it was doubtful that dilatation or vaginal incision would permit of delivery, abdominal incision was called for. In the acute toxemias where the time element entered as a factor, and in rare (acute) cases of placenta prævia, vaginal incision was justifiable; else dilatation should be the rule after a prescribed technique. Such devices as the Bossi dilator should receive the unqualified condemnation of American obstetricians. They were needless where the educated hand existed; they were dangerous under any condition. In the event of incision being indicated, the vaginal Cesarean section was to be commended as preferable to the Dührssen incisions. The indication for either was extremely limited.

THE IMMEDIATE RESULTS OF CONSERVATIVE OPERATIVE MEASURES ON THE TUBES AND OVARIES.

DR. HUNTER ROBB of Cleveland, Ohio, in a paper on this sub-

ject, which was read by title in the absence of the author, stated that in 1904 he read a paper before the Ohio State Medical Society, in which he presented an analysis of 237 patients upon whom conservative measures had been carried out when dealing with inflammatory lesions of the tubes and ovaries. Since then, he had had 167 additional cases, making in all 404 instances in which he had carried out such procedures during the past seven years. He had not included the cases of so-called cystic or cirrhotic ovaries, unless they had been bound down by marked adhesions. He believed that such ovaries were still capable of performing their functions, and the symptoms were apt to be due, not to pathological conditions in the ovaries themselves, but mainly to adhesions which were binding them down. But even when the ovaries had undergone actual inflammatory changes, or where they were occupied by tumor formations, or were bound down by adhesions so that their functions were interfered with and the necessity of operative procedures became imperative, he still had to decide how far he ought to go and how he could get the best results for the patient, not only immediately but later on. From his experience in this line of work for more than seven years, he had been able to thoroughly convince himself of the great advantages that might be obtained by preserving as far as possible the integrity of the pelvic organs. It was true that in a small percentage of cases—2 to 5 per cent.—after such a line of treatment had been followed, the patient would still have to undergo a second operation before she could be completely relieved of her discomfort, and it was also possible that in a few instances, by the introduction of infection under these circumstances, her condition might be rendered even worse. Such cases, however, in his experience were exceptional. Moreover, a secondary operation was not infrequently necessary in cases where radical measures had been carried out; hence it was not altogether fair to blame the conservative measures for the second operation. All had had the experience, in a small percentage of cases, of separating postoperative adhesions after carrying out radical measures. Before, however, employing the more conservative procedures, he had always made it a rule to carefully explain to the patient or to her friends that such measures would be undertaken if in his judgment at the time of the operation they seemed to be advisable. But he further stated that even though he removed what seemed to be the inflammatory area, it might later become necessary to institute a secondary operation before relief was obtained. After this very clear statement had been made to the patient, as a rule she was perfectly willing to take a good many chances if there was a reasonable prospect that the conservation of the pelvic organs would be compatible with future health and comfort, and, as he had already said, from actual observation he had found that it did not become necessary to perform a secondary operation in more than from 2 to 5 per cent. of all such cases. If an ovary or a portion of an ovary could be saved before the menopause had begun, or even during the time in which the patient was experiencing this change, he had

found that not only the immediate convalescence, but also the subsequent condition of the patient was in every way more satisfactory. He was sure that all had seen many patients suffer more after than before the removal of diseased ovaries. In many instances their discomfort was due to the artificial change of life that was thus brought about. In some instances they might complain for five years or longer. Unfortunately, during this time, the addiction to morphine or some other drug habit might be formed in the endeavor to relieve their distress. In his opinion, the prevention of the artificial menopause was the most important reason for leaving the patient her ovaries whenever this was possible, the question of possible pregnancy following conservative measures being apparently only of secondary importance, as in the majority of these cases the patients were in an unhealthy condition not only for bringing a child into the world, but also for the proper rearing of the same. This criticism did not usually apply to those cases in which a tumor was present, implicating only one ovary. Where the question of pregnancy was to be considered, one had to deal with the condition of the Fallopian tubes as well as that of the ovaries.

In the light of the author's experience it was a wiser procedure to remove the Fallopian tube whenever a pyosalpinx existed, namely, when there were microscopical evidences of pus. When, however, the ovary was involved in an abscess formation, the same radical treatment was not always indicated, as the abscess in most instances did not involve all of the ovarian stroma. Furthermore, macroscopical examination of many of these ovaries would show that the abscess was walled off, and the ovarian stroma beneath frequently had been invaded only to a slight extent. In such instances the abscess might be excised and the line of incision brought together with a fine silk or catgut suture. In his series of cases the lateral structures showed macroscopically marked evidences of inflammatory disease, and there were adhesions which bound down the structures. He had included in this analysis only those cases in which he was able to carry out conservative measures, and not those in which he was obliged, on account of the technical difficulties of the operation, to leave the lateral structures on one or both sides, although removal was indicated. The majority of the patients were between 15 and 28. The menstrual history was normal in 123, abnormal in 279 cases. The symptoms in the latter class in most instances were dysmenorrhea, menorrhagia, prolonged or irregular flow.

THE FETISH OF THE OVARY.*

DR. ELY VAN DE WARKER, of Syracuse, N. Y., contributed a paper (by title) on this subject.

*Will appear in a later issue of this Journal.

TRANSACTIONS OF THE NEW YORK OBSTETRICAL SOCIETY.

Meeting of March 13, 1906.

The President, LeROY BROWN, M.D., in the Chair.

DR. JAMES D. VOORHEES presented a paper on

THE ETIOLOGY OF PUERPERAL INFECTION.*

DR. FRANKLIN A. DORMAN read one entitled

THE PATHOLOGY OF PUERPERAL INFECTION.†

DR. EDWIN B. CRAGIN presented one on

THE TREATMENT OF PUERPERAL INFECTION.‡

DR. GEORGE T. HARRISON.—I think, as Dr. Voorhees has stated, that the doctrine offered regarding autogenesis is a dangerous one, although all are prepared to admit that some cases may be due to autoinfection; but they are so few and far between that they can be practically ignored. I do not think it is fair to speak of gonorrheal infection as autoinfection. I think that Williams rightly excluded it from this list. Gonorrheal infection, when it occurs late in the puerperium, as usual, has symptoms which are different from those of a toxemia or infection, and generally are mild in comparison with those of the streptococcic infection. I mean gonorrheal infection, especially as we see it in the hospitals where there are a number of colored women. They frequently are infected with gonorrhea, and a not infrequent sequela in those cases is pyosalpinx or parametritis in the puerperium. In regard to the cases which may appear in the courts, we must admit that autoinfection does occasionally occur, and it occurs often enough to protect the doctors. I have, however, never seen a case where I could exclude infection from without. All these anomalies (invoked to explain autoinfection) may possibly occur and are met with. But, so far as the general practitioner is concerned, he had better think that these cases of infection are due to his own carelessness, or that of the nurses, or of both. With regard to the treatment, I must protest against the use of the curette. However skillfully it may be used it is a source of danger. I have been called in consultation where infection had been caused by its use. I have never seen a severe case

*See original article, p. 753.

†See original article, p. 771.

‡See original article, p. 775.

of infection cured by the use of intrauterine douches; I believe most cases that do get well when they are employed would recover without them. There is always danger in using them; one may break down the wall that Nature has built up to restrain the infection of bacteria by means of the leucocytes. The infection may be carried into the deeper tissues by the lymph current and blood. If one does not use collargol in these severe forms of infection one has not done one's duty. I have saved cases with it that I could not have cured in any other way. In those cases in which intravenous injections cannot be employed, collargol should be given by inunction or by rectum. Another method of treatment that I am astonished that Dr. Cragin has not mentioned to-night is posterior section of the vagina with the use of iodoform. Splendid results were obtained by the late Dr. Pryor, and it should challenge the attention of all. An interesting case was reported in the last number of the *Medical Record* by S. I. S. Price. Dr. Pryor's explanation of his results was hardly correct, although it has been proven that his method was proper. Subsequent investigations have thrown light upon this subject. If iodoform gauze is carried into the interior of the body, the iodoform undergoes decomposition. It was Dr. Pryor's belief that iodine was set free and that this accounted for the bactericidal properties of the iodoform gauze. Recent investigations, however, have shown that it was not due to the iodine alone, but that, in the decomposition which took place, diiodacetylde was produced, which had powerful bactericidal properties. This was thought to be responsible for iodoform poisoning when it occurred. This I believe to be the explanation of this most useful method of treatment. I believe it to be one of the most valuable means at hand for combating this grave affection.

DR. WILLIAM S. STONE.—One of the most important things brought out in the papers was Dr. Voorhees' statements regarding autoinfection. Before Dr. Harrison finished his remarks he admitted its existence when he spoke of its medico-legal standpoint. This brought very forcibly to my mind a fatal case that I saw yesterday in consultation. The family attached no blame to the physician because they had noticed on several occasions during the course of the labor the great care he took in washing his hands. Such occurrences have been brought to my attention on several occasions. I think that, in spite of the fact that Dr. Voorhees believes there might be some danger in teaching autoinfection, it should be recognized, because laboratory researches and clinical experiences have shown that some cases are not due to neglect in washing the hands or boiling the instruments. It must be recognized by all that in some cases at least there are present in the genital tract streptococci which cannot be distinguished in any possible way from the streptococcus pyogenes aureus. There is no use of denying that the natural resistance of the tissues varies, and if

we can teach men to prepare their cases properly and to look more carefully after them during pregnancy, it is not unlikely that many accidents that are not explicable at the present time, may be prevented.

Dr. Dorman brought out chiefly the terminal features of the pathology. While the results of bacteriological examination may disappoint us in giving a prognosis and forming a judgment as to treatment, still the pathology is an accurate guide. The severe cases of genital infection, not the local infections with formation of pelvic abscesses or endometritis, come under three headings, viz.: (1) acute bacteriemia or general septicemia; (2) chronic bacteriemia, or pyemia; (3) acute general peritonitis. I think it very important to differentiate these cases because I believe many of the cases of acute general peritonitis, if diagnosed early enough, may be treated surgically. The cases of acute bacteriemia or general septicemia are the most frequent; those cases in which there are no clinical physical signs referable to the pelvic organs. There is no pain or tenderness, or anything which will enable one to locate definite lesions in the pelvis. These are literally cases of acute blood poisoning. On the other hand; cases of general peritonitis do start with definite clinical signs. If studied closely they are seen to begin in just the same way as cases of acute appendicitis, with local pain and tenderness followed by abdominal distention and a rapid and thready pulse, low temperature, and other signs of general peritonitis. These infections generally travel by way of the lymphatics. Dr. Cragin said that he was never able to save a case of acute general peritonitis; but judging from autopsy findings, I believe if we can see them early enough we may be able to save some by surgical measures. There are two kinds of cases of acute general peritonitis. In one, the uterus and adnexa look to be grossly normal, except for congestion. The peritoneum, both parietal and visceral, does not look altered, but the abdominal cavity is filled with a turbid, seropurulent material. The other cases are found with the uterus, as well as the ovaries, covered with fibrin. The outer ends of the tubes are filled with pus. The intestines appear as one would expect them in cases of acute general peritonitis, with more or less fibrinous exudate. The pus, instead of being turbid and seropurulent, is yellow. These cases are slower in their course and are the cases in which there is a chance to do something in the line of surgery. A recent article, by an assistant in Leopold's clinic, in regard to the anatomical arrangement of the lymphatics of the uterus, should be mentioned. He demonstrated lymphatics in the decidua itself which were found to be developed especially at the junction between the compact and spongy layers, at that point where the line of cleavage occurs in parturition. With the article were several drawings, illustrating the course of the lymphatics in the spongy layer of the decidua. In looking at these drawings one could not but wonder that more women do not become infected.

I think we are all well agreed upon one point; *i. e.*, the harm done in the treatment of these cases by douches in which chemicals are used. I saw a case one month ago which was of peculiar interest to me. The attending physician wished me to decide whether diphtheria antitoxin should be given, believing it to be a case of diphtheritic vaginitis. The woman had been delivered four or five days previously and the perineum had been moderately torn. Bichloride douches had been given every four hours, alternating with permanganate of potassium solution; then the wound was powdered with iodoform and a strip of gauze laid over the perineum. When I saw the patient there was a slough of the perineum and a diffuse rash over the body. The patient was suffering from either bichloride or iodoform poisoning. After all chemicals had been discontinued the patient got well. We have all appreciated this fact, still there is a widespread notion that bichloride or other chemical douches must be used if a temperature occurs.

DR. C. A. VON RAMDOHR.—There is no regular temperature curve of pyemia or septicemia. Whenever there is a rise of temperature it indicates a fresh absorption, and this is the only thing shown by charts. When there is a post-partum rise of temperature the first thing is to exclude appendicitis, pneumonia or typhoid fever, or any sickness which might occur at any other time; if such diseases are excluded, then the temperature can be said to be the result of infection. So much is understood. Unhappily, we cannot exclude the term or even the occurrence of autoinfection, but it is so rare that we should, under all ordinary circumstances, attribute all infection to outside sources. The occurrence of autoinfection is overestimated. I take a stand against a simply swollen breast being classed as an infection, if under such such circumstances there is no temperature. If there is an abrasion of the nipple, bacteria may gain access to the general circulation and cause some temperature. Neither does the subsidence of temperature after massage of the breast show that it has been thereby reduced. If there is a sapremia, one careful saline intrauterine douche occasionally will wash out the putrid material; but we had better go further and remove the debris, by finger or curette; then the infection will cease and the temperature fall. No matter how carefully one uses the intrauterine douche, or how carefully the finger or curette is introduced into the uterus, there will result some abrasion, giving an avenue for fresh infection, and consequently a rise of temperature for the time being. The object is to get out the infecting material, clean out the blood coagulum, and secure a clean and empty uterus. If that can be accomplished then there will not be more temperature. Of course there may be a mixed infection. If there is a pure septicemia or some of the infecting material has gotten into the system, as a matter of course systemic treatment must then be applied. Dr. Cragin mentioned one general agent for use in these conditions, and

that was alcohol. I believe in alcohol in full doses, sometimes two quarts of whiskey a day. I believe that the treatment with collargol is excellent, but the Credé inunction gave me no good results. Intravenous injections of saline solution gave excellent results in cases of mixed infection; but in septicemia pure and simple due to conditions in the genital tract, alcohol is the remedy par excellence.

DR. HERMANN J. BOLDT.—A point which has been practically overlooked is the varying virulence of streptococci. We must bear in mind that there are a number of varieties of streptococci which vary in virulence. If one variety of streptococcus gives rise to an infection it does not necessarily mean that that is the most virulent form; this has been proven by clinical experience and bacteriological investigations. One of Dr. Cragin's charts shows this, where a patient had varying degrees of temperature for sixty days and then recovered. All who have had a large experience in this line of work have seen patients apparently beyond recovery get well. Now, where can the line be drawn? I do not know. I have here the pelvic organs removed from a woman this morning. I saw the woman in consultation on February 26. She was pregnant between $3\frac{1}{2}$ and 4 months. She had been bleeding more or less for about four weeks, and had temperatures varying from 101.5° to 102.5° F. I advised her physician to empty the uterus; he failed, and on March 4 she was admitted to my service in the Post Graduate Hospital with a temperature of 104° . I evacuated the uterine contents on March 5. After the thorough cleaning of the uterus it was washed out with four quarts of a mild carbolic acid solution. I think that one copious intrauterine douche is sufficient, because the more one meddles with such cases, the worse it is. The patient did not improve, on the contrary she became weaker. On March 10, the temperature having varied from 103.8° to 105.8° , the uterus, adnexa and the broad ligaments, as far as seemed desirable, were removed. The temperature dropped to 101° after the operation, without any other therapeutic measure.

The condition is by no means such that she is out of danger. In that class of cases I am unable to say that bacteriological results are of any benefit beyond showing that micrococci of all varieties may be present in the secretions. The blood examinations in my case were negative. At the last meeting of this Society I gave it as my opinion that no positive data could be based upon the blood examination. I adhere to that opinion.

With regard to packing the pelvic cavity with iodoform gauze I have had a large experience and have not had the fortunate results with this method that others have reported. On the whole, the treatment of these patients with infection must be governed largely by the clinical symptoms; we have no positive data for guidance. It is a matter of judgment as to what we should do. In cases of acute bacteriemia nothing will save the patient.

With regard to cases of diffuse puerperal purulent peritonitis, I saved a patient last summer who had this condition following an abortion. She came into St. Vincent's Hospital on a Saturday afternoon. The cul-de-sac was opened and the pelvis packed with iodoform gauze. The temperature went down one degree. Several hours later she had a chill and a rise of temperature to 105°. The patient's condition becoming worse, I opened the abdomen on the following day and found a diffuse purulent peritonitis with thin purulent serum between the intestines. The abdomen was washed out, a radical operation performed and the patient recovered. That is the only patient I ever saw who got well from that form of disease.

DR. GEORGE L. BRODHEAD.—Dr. Voorhees emphasizes the low mortality in hospital work at the present time. In our service at the Post-Graduate Hospital, where most of the work comes from or is in the tenements, with filthy surroundings, etc., we have had only three deaths in the last 3,000 cases, a very small mortality, and I believe it is due to the careful way in which the hospital men do their work. In spite of the low mortality in hospital service all admit that there is entirely too much puerperal sepsis in private practice; we meet with it frequently. Carelessness is responsible for many of the cases, and it is a wonder to me, not that we see so many, but that we do not meet these cases of sepsis even more frequently.

I believe that in the vast majority of the cases of infection, infection has come from without; but we must admit that auto-infection probably does occur. Sexual intercourse may have been indulged in just prior to labor, or the patient may have infected herself by a dirty douche nozzle, or by vaginal manipulations. Latent gonorrhea is no doubt responsible for some of the cases. Now and then we meet with cases like this: A physician is called and arrives just after labor has been completed. He washes the genitals carefully, and makes no internal examination, but the patient does not do well and at last dies of pelvic peritonitis. I do not see how blame can be attached to the physician in such a case. I certainly think it would be wrong to advocate the general use of the antepartum douche, for fear of introducing septic material.

Although we may not shave the vulva in private practice, we certainly can clip the hair very short, and thus reduce the chances of infection. I think it should be done more universally than it is at present. It is hard to do good work unless the patient's vulva is freed from hair. To cleanse the vulva I rely upon acetic acid and chloride of lime, believing in the chlorine as a germicide. Rubber gloves should always be worn.

With regard to temperature due to distention of the breasts with milk, I think there is no doubt about it. I remember when, at the Sloane Maternity, Dr. Tucker called attention to the fact that, with tender breasts, while there might be an elevation of temperature, the pulse, as a rule, was slow;

but with infection of the breasts, there was a rise of temperature with a rise of pulse. We must all admit that we may have temperatures from caked and tender breasts, especially in highly nervous women. It is my rule to regard temperature as due to something besides sepsis, until it is proven that it is due to bacteriemia.

I believe we certainly should employ uterine douches; but we should remember that serious symptoms sometimes follow their use. I have seen a temperature of 106.5° follow the use of a uterine douche. I know of one case seen two years ago where, following the uterine douche, the patient became almost maniacal, the pulse went to 160 and the temperature to 105° . I have in mind another instance, occurring in a friend's practice, where the patient died three hours after the use of a uterine douche. The finger should be used whenever possible, in exploring the puerperal uterus; but we meet with cases at times where it is impossible to empty the uterus with the fingers, and we are compelled to resort to a curette. The instrument should be used gently, of course. Flint and Edgar advise the use of a 50 per cent. solution of alcohol as a douche in those cases where the uterus is apparently empty, and where the uterine douche of normal saline solution fails to bring the temperature down.

With regard to prophylaxis, I think that here comes in the question of retained membranes. I believe it is wrong to teach that the uterus should be explored for pieces of retained membranes. At the Sloane, when I was there, we left the membranes alone in about a thousand cases, and we got as good results as when they were removed manually or instrumentally. I never go into a uterus immediately after labor to remove retained membranes and, it seems to me, the patients do as well as when the membranes are not retained. The uterus should never be entered simply because of retained membranes. Dr. Edgar, in his text-book, says that the mere retention of membranes in the uterus is no indication for entering that organ, unless symptoms of sepsis are present. In bacteriemia, I have relied chiefly upon the use of alcohol and strychnine. I have used the Credé ointment in these cases with apparently good results in some and with no result in others.

I wish to ask Dr. Cragin if in his closing remarks he will tell us whether he advises curettage when called in consultation to see a case of phlebitis. Phlebitis is supposed to come from infection. In my own cases I have not curetted, and in consultation have not advised it.

DR. J. C. EDGAR.—By one who has followed the literature on the subject of autoinfection for five years it will be noted that the belief in autoinfection has become stronger and stronger. The statement made regarding the bactericidal action of the vaginal mucus is being denied more strongly and vigorously each year. Personally, while I have accepted laboratory researches as regards the bactericidal powers of the vaginal

mucus, at the same time clinically I have never really believed in them. The proof of this is found in the fact that during fifteen years of service at the Bellevue Emergency Maternity, not once have we abandoned the ante-partum douche. The vagina is washed with soap and water and bichloride vaginal douches are given as in the early nineties. We cannot do away with the douche. As a lubricant for the passage of the child lysol or creolin is used.

The preparation of the vulva is one of the most important items in prophylaxis. At the New York Maternity we used to shave the vulva as a routine practice. At the Emergency Hospital, in 1890, all cases were shaved, but we found that unless a skilled nurse did the shaving, more or less of a mess was made of it, and the little cuts made by the razor offered ready foci for infection. Therefore, we adopted the plan of cutting the hair short with scissors, thus doing away with the razor.

A good deal has been said about irritation of the breast as a cause of nonseptic fever. I think a more frequent cause comes from the bowels. How often do we see a temperature of 101° or 101.5° F., which falls immediately after a saline has been administered and the bowels evacuated. This is as well recognized a fact as the cause of the morbidity statistics in the German maternities as is the condition of the breast.

I agree with what has been said regarding the unsatisfactory results of bacteriological examination of the secretions from the cervical canal. The culture report from the laboratory is often negative, and yet patients die from streptococcic infection, as proven at autopsy.

I am in accord with what has been said about the Credé ointment; and also in regard to the streptococcic serum. Apparently they have supporting powers; whether anything more I cannot say.

Puerperal infection is to-day common in New York. I have just jotted down a few figures showing one year's work at the new Manhattan Maternity Hospital on Sixtieth Street. We had 176 cases in our home or out-door service, and our morbidity (temperature of 100° or over) was only 2 per cent. and no deaths. In contrast to the home service, the hospital ward review showed 187 cases, with a morbidity of 17 per cent., and three deaths, two being due to sepsis. In explanation of these figures I would say that the hospital service is kept almost exclusively for the ambulance or emergency cases that are sent in from outside physicians and midwives.

DR. R. A. MURRAY.—Two factors in prophylaxis were overlooked in the papers. One was that when we scrubbed the mucous membrane we were likely to remove epithelium. I believe in cleaning with green soap and absorbent cotton. The hair about the vulva I always clip, but never shave. The general cases are usually very bad. I insist, in these cases, upon giving a full dose of ergot in order to keep the uterus contracted. I believe the greatest cause of puerperal sepsis is subinvolution

of the uterus. I always insist when the labor is prolonged, and especially if the head is long in coming down, that the passage should be lubricated with oil brought to the boiling point. I agree with the suggestions made at the congress in Paris, that there is no better way of preventing absorption than by keeping the passages well lubricated to prevent abrasions. Another thing of importance is that the nurse usually washes the vulva from behind forwards, carrying the feces into the vagina. I think many cases are infected in this way. When I was on service on the Island the head nurse insisted that the nurses should be educated constantly regarding puerperal fever. The result was that our cases were diminished to one-fifth and later ceased altogether.

DR. GEORGE M. BOYD, of Philadelphia (guest).—I agree with the speakers with but few exceptions and only on minor points. I think autoinfection is a bad term. There are cases in which an old latent poison has been rekindled. Probably the only true autoinfection is from intestinal poisoning. Pathogenic organisms are made active through the trauma of labor. I think we are agreed that the poison comes from without. We must always teach that.

I have been following Dr. Edgar's course in regard to the douche. The lessons I have learned have been from following the work in the Lying-In Charity of Philadelphia during the past sixteen years. During that time there have been 5,000 cases of indoor work, and as many treated by the students at the patients' homes. During the sixteen years the antepartum douche was advised as part of the means of getting the patient as clean as possible. I see no reason why we should change our course along that line. I have always used bichloride of mercury as a chemical douche in delivery, and have never seen any bad or poisonous effects follow. Years ago, in visiting New York, I remember the late Dr. Lusk cautioning physicians against too active interference, manual or instrumental, in cleansing an infected uterus. He thought it unwise to curette the uterus. I personally have never curetted an infected uterus, nor have I curetted a uterus in the earlier infections following abortion. I believe the douche is often of service. In addition I have often explored the uterus with the finger, and so aided in emptying that organ. In regard to operative interference and the graver operations for infections of the uterus, I have always felt that it was a mistake to consider hysterectomy early in the puerperium. Later on, the results of such a procedure are satisfactory in some cases. Undoubtedly hysterectomy has a small field of usefulness in puerperal sepsis.

DR. MALCOLM McLEAN.—I have practically put aside for ever the curette as an instrument to be used in the puerperium. I think it is a mischievous instrument. For the curette I substitute a smooth forceps. I cannot remove the detritus in the horns of the uterus with the finger once in five cases. I use a

pair of forceps, carefully and smoothly, and, in this way, I know that I am not abrading the endometrium. I do not like the intrauterine douche; I have seen much mischief done with it, even death produced by it, and in the hands of a good man, too. On account of the danger, I have substituted the cotton sponge, going gently over the endometrium with the strongest tincture of iodine. Any man who thrusts aside this agent as an antiquated portion of his armamentarium, throws out one of the most valuable of germicides. It seems to have a peculiar power to follow up the bacteria into the tissues a certain distance, probably in the manner that Dr. Stone has told us about, into the lymphatics.

DR. J. D. VOORHEES.—In taking the attitude which I have expressed in my paper to-night, in regard to so-called autoinfection, I expected to stand alone. Consequently I am glad to find that so many of the speakers agree with me that cases of autoinfection do occur now and then. This doctrine I will admit is a dangerous one to teach and will often be held responsible for puerperal sepsis to ease the conscience; but I think most of us are willing to take our medicine if infection can be reasonably attributed to our carelessness in the handling of labor cases. In order to explain the high morbidity occurring in maternity hospitals under the most approved technique and in private work as well, I believe that oftentimes germs of some degree of virulence must be present in the genital canal before the case comes into the hands of the physician. I cannot agree with Dr. Harrison in his statement that a gonorrheal infection should not be regarded as an autoinfection. The gonococcus is very frequently present in the vagina and can easily live there for variable lengths of time. After labor we all know the conditions are very favorable for its growth. I grant that most of the cases of gonorrheal infection are mild in character, but even when mild the sequelæ are pronounced and persistent, as evidenced in enlarged tubes and pelvic peritonitis. On the other hand, after a streptococcic infection the pelvic organs are in as good a condition as previously. Besides, many severe and fatal gonorrheal puerperal infections have been reported. We recently lost a patient at the Sloane Hospital from a gonorrheal peritonitis occurring early in the puerperium. Dr. Boldt mentioned that insufficient stress was laid on the different varieties of streptococci found in puerperal infection. I tried to bring out this point in order to account for the varying severity of the cases. No doubt many varieties exist, aerobic and anaërobic, which exhibit all degrees of virulence and in culture growth show different manifestations. Some streptococci found in the vagina are nonvirulent, some may have been virulent at first, but may have lost their virulence and become nonpathogenic in the genital tract. Other streptococci may have simply lost a part of their virulence, but under favorable conditions may be capable of regaining their original virulence, while others, as claimed by Natvig, in a recent article, may live

in the vagina in a saprophytic state but may ascend into the uterus after labor and cause a puerperal infection.

I was much interested to hear that Dr. Edgar and Dr. Boyd were using vaginal douches preparatory to labor. I had thought the results of Krönig, Döderlein, Bumm, Leopold, Mermann, Norris, Zweifel, Pestalozzi, and others, had proven that ante-partum douches did more harm than good. I would like to hear from these gentlemen what the morbidity rate has been in returning to the old line of treatment. There is a possibility that in emergency cases an ante-partum douche may be beneficial.

DR. EDWIN B. CRAGIN.—Regarding Dr. Harrison's emphasis of the dangers of the curette, I can say that I am glad to hear it, for there is much harm attached to its use. The question, however, is not on the curette itself, but upon how to use it. By curette I do not mean the sharp curette. One-half of a looped sponge holder will often serve the purpose. The fingers should be used as far as possible, but occasionally you need something to help you, and then you should use that which will do the least harm to the walls of the uterus.

Regarding Dr. Harrison's reference to Dr. Pryor's treatment, that of curetting the uterus and then opening the cul-de-sac and packing with gauze, I will say that I have used it in the early pregnancy cases, like miscarriages, when infection existed; but in the full term cases it has seemed to me to open too many new avenues for infection, and therefore I do not employ it.

Dr. von Ramdohr speaks of one douche being all that is necessary. The reason for using more than one douche in the case represented by the chart was that the first douche did not cause the temperature to stay down and each subsequent douche brought away débris showing that the uterus was not empty. The chart hanging there speaks for itself. The curette showed that a portion of placenta had been left behind, and when that was removed the temperature came down. It shows that the douche will, at times, not suffice in cleaning the uterus of its débris. I am willing to admit the criticism. I should have gone in with the finger earlier. What we want is to make sure that the uterus is free from decomposing material and to do it as gently as possible.

As to Dr. Brodhead's question regarding the performance of a curettage during an attack of phlebitis, personally, I would not do it, but would prefer to leave the patient alone, lest in the curettage I should open new channels of infection and make the patient worse. Bearing on the etiology of phlebitis I have in mind an interesting experience. A patient of mine, after a perfectly normal course for three weeks after delivery, on the twenty-first day had a slight rise of temperature and developed a phlebitis. On the following day she passed from the uterus a small piece of membrane about an inch square, which was foul. I have always thought that this piece of membrane was the cause of the phlebitis; that it was so firmly attached

to the uterine wall that it retained its vitality for a long time, but finally sloughed and caused the phlebitis. I am inclined to think that many cases of phlebitis coming on late after a normal puerperium are caused in this way.

As to Dr. Edgar's statement about the condition of the bowels being more or less responsible for certain rises of temperature, I will say that I thoroughly agree with him. It seems to me, too, that the mere movement of the bowels with its accompanying straining often compresses the uterus enough to empty it, so that the benefit comes from the emptying both of the bowels and of the uterus. I should feel as Dr. Edgar does, that the use of an ordinary razor might be an element of danger from numerous abrasions. At the Sloane Maternity we use a safety razor, which is free from these objections. I also agree with Dr. Murray that there is such a thing as scrubbing too hard and lessening the protection of the epithelium of the vulva. We want to cleanse the vulva thoroughly, but gently, so as not to do harm.

Regarding the behavior of nurses, I wish to thank Dr. Murray for calling my attention to it, and will say that I will endeavor to have the nurses coming to the Sloane Hospital properly instructed in the matter.

TRANSACTIONS OF THE SECTION ON GYNECOLOGY OF THE COLLEGE OF PHYSICIANS OF PHILADELPHIA.

Meeting of February 15, 1906.

The President, W. REYNOLDS WILSON, M.D., in the Chair.

DR. CHARLES P. NOBLE presented a

FINAL REPORT ON A CASE OF DECIDUOMA MALIGNUM.

The history of this patient was read before the Section on Gynecology, April 17, 1902, and was published in the *AMERICAN JOURNAL OF OBSTETRICS* September, 1902. Briefly, the history is as follows: Mrs. D., aged 24 years, has had two pregnancies; the first ended in miscarriage at the fourth month in 1899, and the second at the sixth week, August 15, 1900. The patient's general history presented nothing of interest. Her menstrual history was normal from the age of thirteen to twenty-three. During the past year menstruation has been irregular, appearing in from three to six weeks. The duration of the flow has been seven days. There has been marked pain for one week and also during the flow. Since the last miscarriage, August 15, 1900, the flow has been constant. It was profuse during the first two weeks and has varied since that date. The patient

was taken to the Kensington Hospital for Women, November 14, 1900, three months subsequent to the miscarriage. Examination showed a normal vagina and cervix; also a tumor connected with the cervix filled the pelvis. The tumor had the general characteristics of a fibroid, but was notably softer than the average fibroid. An abdominal section, performed November 17, showed that the tumor was evidently malignant and grew from the fundus of the uterus. The tumor was of a dark blue mottled appearance, and looked much like a hematocele covered by membrane. The omentum was adherent to the bladder, and apparently the tumor had penetrated both the omentum and the bladder. A diagnosis of deciduoma malignum was made from the history and the appearance of the tumor. In attempting to separate the bladder from the tumor the finger pushed through the soft structure of the tumor and a definite amount of tumor substance was left upon the fundus of the bladder. It was believed that the malignant growth had involved the bladder and that its complete extirpation would necessitate the removal of a considerable portion of that viscus. As the patient's feeble condition did not warrant such an operation, this was not attempted. A supravaginal hysterectomy was performed, with the view that the case was a hopeless one from the standpoint of radical cure. Gauze drainage was employed. Convalescence was febrile until the sixth day, after which it was uninterrupted. Three months later the patient had regained the appearance of health and expressed herself as feeling well. Upon pelvic examination the vagina was found normal, but a distinct mass could be palpated upon the bladder wall where the portion of the tumor had been left. Sixteen months after operation the patient was again seen. She presented every evidence of good health and expressed herself as feeling quite well. A careful examination failed to show any evidence of malignant disease in any portion of the body. The mass which had been felt on the bladder at the preceding examination had entirely disappeared. The vagina, bladder and broad ligaments, were entirely normal to touch.

Mrs. D. continued to enjoy good health until October, 1904, with the exception that in 1902 she developed a small goiter in the left half of the thyroid, and also a ventral hernia due to gauze drainage. October 18, 1904, she developed a pleuropneumonia, and was confined to bed for four weeks. She made a fair recovery from this, but did not regain her strength. About the first of May, 1905, she began to fail, spitting blood at intervals and gradually losing weight and strength. Her physician, Dr. Adam Klemm, was under the impression that she had developed a secondary malignant infiltration of the lung. She died September 6, 1905. I saw her a few days before her death and made a careful physical examination. She was much prostrated, had a rapid pulse, and was expectorating mucus. The sputum had never been examined for tubercle bacilli. Careful examination of the chest showed no evidences of consolidation,

the lungs were everywhere resonant upon percussion. Auscultation likewise showed no evidences of consolidation. Careful examination of the mediastinum also gave no evidences of a solid tumor. The heart was much dilated and the heart muscle acting very feebly. Examination of the abdomen showed no evidences of a recurrence. It seemed to me that the symptoms could perfectly well be explained upon the diagnosis of dilatation of the heart subsequent to the pleuropneumonia. No autopsy could be obtained, and therefore the question must remain open as to whether or not there was a secondary involvement, but it is my own opinion that there was no definite evidence of such an involvement.

The point of chief interest in this case is the disappearance of the portion of the tumor left upon the bladder wall. It was my opinion at the time of the operation that the tumor had infiltrated the wall of the bladder, but even if this were not true, it is undoubtedly a fact that a portion of the tumor was left adherent to the bladder, and that its nutrition was maintained for some months subsequently, and that then it disappeared. The spontaneous disappearance of the tumor in this case confirms the reports of other observers in cases of deciduoma malignum and shows that the prognosis is not necessarily fatal even when the entire disease cannot be removed.

DR. JOHN C. HIRST read a paper entitled

THE CAUSES AND TREATMENT OF METRORRHAGIA, WITH ESPECIAL
REFERENCE TO THE USE OF SCHATZ'S METRANOIKTER
AND ATMOKAUSIS.*

DR. RICHARD C. NORRIS.—I have had no experience with the instrument for the application of steam, but believe that it has a field of usefulness. I have used the metranoikter, but only the four-branched dilator, and have found it of special value in incomplete abortion in multiparous women for making a thorough digital examination of the interior of the uterus. It worked most satisfactorily and without causing much pain. In women who suffer from dysmenorrhea and sterility, for whom the usual method of rapid dilatation had previously been employed with little or no success, I have systematically used it during the past year, and on the whole have been very much pleased with it. In some cases it causes considerable pain, but the use of a hypodermic during the night before it is removed has usually overcome that. In some cases of nulliparous women in whom the vaginal canal was small I have used the modified type of the instrument, having the springs made a little longer in their antero-posterior diameter and shorter in their lateral diameter. Even this modified instrument, on two or three occasions could not be introduced into the vagina. When I attempted to put the springs of the instrument in the vagina after inserting the blades through the cervix, I could not get the former through

*See original article, page 796.

the vulva. It occurred to me that I might leave it in that position, which I did. The spring, outside of the vagina, was wrapped in gauze, and, thus protected, remained for twenty-four hours, and the result was as satisfactory as if it were in the vagina. The patient has been relieved, and it was a fortunate circumstance that I tried it, because its field of usefulness, in my experience, will thus be increased. In such a case, of course, it drags the cervix to the vulva until the instrument is removed on the following day; but this has made no special difference. I believe it is a useful instrument, and I have used it routinely in the cases of young women with flexion and stenosis where I used to do rapid dilatation. In a certain proportion of the cases treated by the latter method I found that the uterus would again contract, the cervix become narrow and there would be recurrence of menstrual pain. When I was a student Dr. Goodell taught us that rapid dilatation had to be sometimes done even a third time because of this subsequent contraction of the cervix. In such cases this instrument finds its special field, and in these I have found it to work splendidly. I have dilated eight cases operated on by other men with the usual method of rapid dilatation followed by prompt recurrence of dysmenorrhea, and this instrument has relieved the condition in these cases. Instead of putting in gauze packing after rapid dilatation we use the metranoikter, allowing it to remain in place for twenty-four hours. In incomplete miscarriage when it is desired to palpate the fundus or in those cases of hemorrhage when it is of the utmost importance to know what is in the uterine cavity, the introduction of the instrument and leaving it until the next day permits digital examination of the fundus without any difficulty. On two occasions its value as a means of digital exploration of the uterine cavity has saved me the removal of uteri. One case was that of a submucous fibroid which I was able to excise and extirpate without taking out the uterus. The instrument may be considered a modern tent, readily sterilized by boiling.

In the past we have all removed uteri thinking there might be malignancy in spite of the microscopic report. In these border-line cases, such as those of persistent hemorrhage without evidence of malignancy, treatment by the use of steam should be instituted before resorting to hysterectomy. The reports from various sources induce me to believe the instrument is likely to prove a useful addition to our armamentarium.

DR. CHARLES P. NOBLE.—I have had no experience with either of the instruments described. I feel that we are in need of improvements upon the usual methods of dealing with hemorrhage, particularly in the group of cases referred to by Dr. Norris, those women who bleed and are curetted and bleed again, and perhaps bleed after being curetted several times, yet have neither cancer nor tumor. Every gynecologist meets with such cases at rare intervals. Sometimes there is endometritis; at other times the microscope shows practically no change in the endo-

metrium. In reference to the young woman referred to by Dr. Hirst, I think that as a rule the cause of hemorrhage in these cases is simply glandular hypertrophy. Personally I have never had a patient of 14 or 16 years of age who has bled too much and in whom the microscope showed infection. There has simply been hypertrophy of the glandular tissues. In my experience two curettements have cured such cases, although I have heard of instances in which half a dozen curettings had not controlled the bleeding. I would hesitate about using steam in a girl of that age. The risk of shutting up the uterus in a young girl is a matter for careful consideration. I recall a case seen years ago, in which the pathological report was adenoma, and which I curetted several times. The growth would reform and the hemorrhage continue. The ovaries were removed, thinking this would control the bleeding which, however, recurred as promptly as after the curetting. I dilated the cervix and packed the inside of the uterus with gauze soaked in a 50 per cent. solution of chloride of zinc, which caused the inside of the uterus to slough, after which the patient made a good recovery. It is unnecessary to say that such treatment would be improper in a young woman having her ovaries and tubes.

DR. BARTON COOKE HIRST.—I heard of the preparation of this paper only a few days ago, and therefore have not had time to receive answers to the letters which I wrote to all the women on whom the metranolite was used. There were, I think, about twenty-five of these cases and eight or ten cases in which atmokausis was employed. Some of the patients, however, I remember, and have kept in touch with since the operation. One was particularly interesting: a middle-aged woman who came to me after having been treated at the Johns Hopkins Hospital. The excessive metrorrhagia from which she suffered near the menopause was suggestive of malignancy. The uterus was curetted and the scrapings were submitted to two pathologists. One said there was adenocarcinoma; the other said there was nothing of the kind. From my observation of the case and examination of the specimens I agreed with the latter opinion. After atmokausis was applied the hemorrhage was checked for some six months. It then recurred. A second time I curetted the uterus and again used atmokausis. This was four months ago, and there has been no hemorrhage since. The result of the microscopic examination of the scrapings after the second curettage is interesting. At the first examination the endometrium was so thick and hypertrophied that it naturally aroused the suspicion of adenocarcinoma, but the second curettage removed only a little thin tissue in which there was scarcely a microscopic trace of endometrium. The mucous membrane seemed to be completely destroyed by the first atmokausis. The second application was deliberately made for forty-five to sixty seconds at a temperature of 115° C. with the expectation of closing the uterine cavity.

The metranoikter is valuable in the cure of sterility and dysmenorrhea. If there is anything at all in the dilatation of the cervix, the more thoroughly it is done the better the results. I feel confident that I have had better results in the last two years in the treatment of dysmenorrhea and sterility than before. I recall two cases of married women, sterile for eleven and thirteen years, who were cured by the use of the metranoikter. Both women became pregnant; one went to term; the other miscarried. I believe we get decidedly better results in cases of dysmenorrhea than by rapid dilatation, but even with this instrument, we must expect a certain proportion of failures and of recurrences. There was a patient in my office a few days ago upon whom I had used the metranoikter ten months before. She had the severest type of dysmenorrhea. She was entirely relieved after the use of the metranoikter for ten months. Just now the symptoms are recurring, so I propose to use the metranoikter again. I might say that there would probably have been a permanent cure had I been allowed to replace the uterus, which was retroverted. This time I shall do an Alexander operation as well as dilatation and curettage. I would not care to use this instrument at the same time that an operation was performed for fixing the uterus in position, because its removal is difficult without making quite strong traction upon the uterus. In such cases I would prefer to use the metranoikter first and then a couple of days later to do the operation selected for the cure of the retrodisplacement.

DR. BROOKE M. ANSPACH.—I have been especially interested in the cause of the rather obscure cases of uterine hemorrhage occurring in women about the menopause. There have been three at the University Hospital in Dr. Clark's service, in which none of the usual causes of hemorrhage could be found. The lesion is most likely one of the uterine muscle—an insufficient contractile power of the myometrium. Metrorrhagia depending upon such a condition may be spoken of as myopathic (*metrorrhagia myopathica*). To determine, if possible, the pathology of such cases, I have studied the uteri of the ones mentioned and compared them with eighteen others removed in the course of radical operations for pelvic inflammatory diseases. The specimens were taken from women of different ages, some of whom had borne children, some of whom had never been pregnant. Arteriosclerosis has been considered one of the causes of metrorrhagia at the menopause; in this series I found that arteriosclerosis in the vessels of the uterus occurs apparently as the result of pregnancy. It can be easily determined from the elastic tissue in a stained section whether the uterus is that of a nulliparous or of a multiparous woman. Childbirth produces a great increase of the elastic tissue around the blood-vessels and in their walls. Two of those cases in which there had been metrorrhagia of such severity that hysterectomy was required showed rather less increase of elastic tissue in proportion to their parity than occurs normally. Whether this is a rule, will require further

observation to determine positively. There was no very constant variation in the amount of fibrous tissue in the cases which were the subjects of metrorrhagia; and the increase in fibrous tissue as a result of pregnancy was not nearly so marked as the changes in the elastic tissue. I think that the question of arteriosclerosis of the uterus as a factor, *per se*, in the hemorrhage, can be counted out. The cause of the hemorrhage evidently is from some insufficient contractile power of the uterus which allows congestion and which results in the outpour of blood. From my observations I should be inclined to believe that the elastic tissue of the uterus plays a large part in these myopathic cases.

DR. JOHN C. HIRST.—I have nothing to add, except one point which did not really come within the confines of the paper. It is that last year I used this atmokausis apparatus upon a patient suffering from a profuse and very irritating leucorrhea from an old gonorrheal infection. She had been curetted times without number, and had the uterus wiped out with carbolic acid. It occurred to me that if everything else had been tried it might not hurt to try atmokausis. That patient, four months afterward, since which time I have not seen her, was free from her leucorrhea. I mention this merely as a suggestion as to the possible use of the apparatus, although from one case no conclusion can be drawn.

TRANSACTIONS OF THE WOMAN'S HOSPITAL SOCIETY.

Meeting of January 23, 1906.

The President, DR. MALLETT, in the Chair.

DR. BROUN reported a case of

INTESTINAL COLLAPSE IN PRESENCE OF ROUND WORMS; PRO-
FOUND SHOCK FOR EIGHTEEN HOURS FOLLOWING
OPERATION.

I have here three round worms which I show on account of the peculiar interest attached to their presence and finding. Some two weeks ago, while operating for a retroverted adherent uterus, I noticed when the abdomen was first opened that a portion of the small intestines was ribbon-like, while that portion above and below the contracted part was normally distended. There were no bands of adhesions. While stripping the collapsed portion between the fingers three separate rod-like bodies were felt in the convex portion of the gut; these were separated from each other by a few inches, and each of these bodies was about six or eight inches long. When the portion of the intestine occupied by them was held up the slow motion

of the worms was easily seen. The operation for which the abdomen was opened, an intra-abdominal shortening of the round ligaments after severing the adhesions, was completed and the abdomen closed. The adnexa were not removed. The patient was put to bed with a normal pulse. A few hours after the operation it was about 130 and very feeble. The patient showed every sign of extreme collapse. There was no tangible explanation of this condition, since no vessels had been cut or ligated. This collapse was unattended by fever. The usual cardiac stimulants were used. The following morning the pulse, while improved, was still feeble and rapid. Twelve hours later all signs of collapse had vanished. The worms were expelled on the fifth day, after giving the usual remedies. The recovery was not further interrupted. In looking over the literature on *ascaris lumbricoides* I find that marked intestinal disturbance and depression at times attend their presence in the intestinal tract, and it seems to me that to their presence and that of the toxins thrown out by them on being handled was due the profound collapse of the first eighteen hours. On no other grounds could the condition be explained, since the patient was a young woman of about 35 and well nourished, with no heart lesion.

DR. MALLETT.—No explanation of why there should be a collapsed intestine when the worms existed has been offered.

DR. BROWN.—I think the ribbon-like condition of the intestine was without question due to the irritation of the worms.

DR. BALDWIN.—I should consider the presence of the worms in the intestinal canal merely a coincidence.

DR. WEST.—I think the same as Dr. Baldwin. There is no evidence to show that worms produce toxins. I should be inclined to think that the collapse was possibly due to shock from handling the intestine. I think Dr. Brown's explanation of the emptying of the intestines is excellent.

DR. BROWN.—When worms are present in a child's intestine there is gastric disturbance. If worms are handled roughly they must resent it considerably, and I reasoned that more toxins would be thrown out. I was borne out in that idea by Osler's speaking of the depression caused by worms in old people.

DR. RAWLS.—I was called to see a woman 59 years old, who had diarrhea, and treated her in the ordinary way with no result. As soon as she expelled a round worm she became very much depressed. I found no others. The authorities on the subject whom I have consulted all say that the depressed state is the rule with old people, and that it is due to the excretion of toxins.

DR. JAMES N. WEST read a paper entitled:

CONSERVATIVE SURGERY OF THE UTERINE ADNEXA.*

DR. BALDWIN.—I have been totally unable to formulate

*See original article, page 803.

any rules as to what cases to leave and what not to leave. Dr. West said very little about the double collections of pus in the ovaries. I wish to allude to two cases.

One of them, a young married woman, I supposed to have a postoperative abscess. I found one ovary which I incised, letting out two or three drams of pus. The other ovary also contained pus. It was a case where I should have removed both ovaries. That woman had an uninterrupted recovery, and has remained perfectly healthy for four or five years. In another case the abdomen was opened about four weeks after the birth of a child. The patient wished to have a portion of her ovaries left. She also made an uninterrupted recovery, but has not since become pregnant. Those are the only two cases of double ovarian abscess where I have left a portion of one ovary. I have been disappointed in some cases by having the remaining parts of the ovary develop into cysts.

DR. BROWN.—The custom, about six or eight years ago, was to remove both ovaries and tubes. This custom was the origin of the papers of Drs. Burrage and Dudley on conservatism. They argued not only that the healthy ovary and tube should be left, but also that some of the same ovary should be made to serve the other. At the present day, the word conservatism carries with it an entirely different meaning. There is hardly an operator at the present time who would think of removing any portion of an ovary or tube that appeared to be healthy, which accounts for the scantiness of the literature since 1901. The conservatism of the present day resolves itself into the treatment of such portions as are diseased. As to a diseased ovary and tube upon one side the question is: are we to leave it after having done some resection, or are we to remove it entirely. There are two axioms in surgery: one is to remove no normal tissue; the other is to leave no abnormal tissue if it conserves the interest of the patient. I believe it is to the interest of the patient, if one knows one tube and ovary to be healthy, to remove entirely the diseased adnexa of the other side. If the disease exists in the distal portion of the tube, I see no reason why we should simply resect that tube if the other ovary and tube are healthy. I believe fully that in no ovarian cyst should we leave any of the tissue of that ovary. Concerning cases of pyosalpinx, we can empty a pus tube of its contents, wash it out, and the patient will make an uninterrupted recovery. The question is, whether she will be relieved of the symptoms for which she went under the operation. I doubt it; certainly the endothelial lining has been destroyed by the presence of the pus, and the tube has become useless. I see no reason why we should leave it, for while doing so we cannot promise a relief from symptoms. My habit in such instances is to remove the tube entirely. I think it is greatly to be regretted if we are forced to take out both ovaries of the patient. There is no question but that if the ovaries are diseased

they should be removed; but if they are not diseased, and where it is possible, I think it is wise to leave a good portion of the ovary, since certain secretions are thrown out which preserve the nerve balance of the patient. The patient makes a better recovery, and there are fewer stormy after-symptoms.

DR. BISSELL.—I seem to be in the minority regarding the question of always removing the entire ovary where a neoplasm is present. I do not believe it necessarily follows that the entire ovary should be removed. Where the patient has passed the menopause, I agree with Dr. West's point of view; but where the patient is under 45 years of age and a neoplasm such as a dermoid cyst exists with some normal tissue about it, I believe we are justified in dissecting away the growth and preserving the normal tissue. Two or more years ago I reported before this Society a case in point. A young woman 22 years of age was operated on by me for the removal of an ovarian tumor. On opening the abdomen I found a dermoid cyst, the size of an orange, of the left ovary. The right ovary was apparently normal. I dissected away the dermoid cyst and sewed together with catgut the raw surface of the remaining ovarian tissue. She made an uninterrupted recovery; but in the course of a year another tumor was discovered on the right side. On opening the abdomen I found a tubercular cyst of the right ovary with little or no healthy ovarian tissue, so the entire organ was removed. The left ovary or the part of it which I left the year previous, was apparently perfectly healthy. The patient made a perfect recovery. I have always used fine catgut in these cases, and only once or twice have I had reason to believe adhesions of the organ followed. It has not yet been determined what suture material is the greater irritant and is most likely to have adhesions follow its use. Catgut would, theoretically, seem to be the least objectionable.

DR. JESSUP.—I have been interested in this subject from the pathological standpoint. The material from various hospitals that I have examined during the past eight years has been largely of this type; and it is instructive to note the change in the character of the specimens sent. Formerly it was the rule to receive both tubes and ovaries; now it is the exception. Another point of interest is the question of what ovaries shall be termed diseased. Many ovaries that we examine contain small mucous cysts in varying number and are rather fibrous on section. Microscopical examination shows in addition, lutean bodies, ranging in size from the large recent ones to the small scars of dense fibrous tissue. Shall such ovaries be considered pathological and a diagnosis of oöphoritis be sent back to the surgeon? I have recently been discussing that point with pathologists and asking whether we were not to blame for sending back reports of chronic oöphoritis in such cases, thus leading the surgeon to think that he was justified in the removal. A fibrocystic ovary is pathological in the sense that it could not be used for teaching a class in normal histology; but it

is the type of ovary that we find in all women who have menstruated for several years, showing cystic degeneration of some of the Graafian follicles and the scars of others. In this sense it is normal, and might better, for the ends of the surgeon, be termed such. We find somewhat the same conditions with regard to kidney specimens. In the laboratory there is a saying that you cannot find a normal human kidney for teaching normal histology. In regard to these corpora lutea, which are recent and contain much blood, so that they look and feel cystic, a surgeon recently told me that in assisting in operations he had been surprised to see ovaries removed in which apparently the only lesion was a recent corpus luteum. I have with me such a specimen, an ovary removed from a young unmarried woman, who was operated on for appendicitis. The ovary was removed because enlarged; the enlargement was due to a recent corpus luteum, which caused a protrusion at one end and gave a cystic feeling. The only cysts present were the small mucous cysts, 2 to 4 mm. in diameter; and the ovary was one which could well be termed normal.

DR. PINKHAM.—In regard to removing the whole of every tube which contains pus of any kind, I should feel particularly badly if the consensus of opinion is affirmative. I believe, of course, that a chronic pyosalpinx should be removed; but there are other forms: the acute type and the gonorrheal type, which I believe can be treated or resected with benefit to the patient, especially those of the acute type. We oftentimes come across a case of acute septic salpingitis where there is not a dense infiltration of the wall of the tube; I believe that resection or drainage can be done in these cases, and I think that in the gonorrheal type, where the epithelium is not destroyed, we should save some of the tube, so as to enable pregnancy to occur if that is desired, even at the risk of a future operation.

DR. WEST.—I should, perhaps, have said more about ovarian abscess, because a good many operators advocate leaving a part of the ovary. If both ovaries were the seat of abscess, I should certainly be inclined to leave a part of one ovary, if possible, to continue the function of menstruation. These reports were not quite as early as Dr. Broun thought. The last, and what I consider the great report of Dr. Dudley, was made in 1903, and embraced reports sent in by men in that year, so a good part of this work was comparatively recent. Dr. Burrhage's report was made in 1901. I think the profession is not united about leaving part of an ovary if it is the seat of a neoplasm. My opinion is that we ought to take it out. Dr. Bissell is not quite so much in the minority as he is inclined to think. In regard to Dr. Broun's remarks that the contents of a great many of the tubes are sterile, I would say that I had occasion to look up this subject about two years ago, analyzing several reports of the examination of pus at the time of operation, and 40 per cent. showed the presence of living pathogenic organisms. There is marked tendency to dying out of the or-

ganisms, for the tube becomes sterile as the time from its infection advances. The case which Dr. Bissell has just quoted to illustrate his point of view, would occur so seldom that I hardly feel that that one case would justify us in leaving behind part of an ovary which was the seat of a neoplasm. My experience has been that where there has been a glandular cyst, it is very apt to return.

TRANSACTIONS OF THE WASHINGTON OBSTETRICAL AND GYNECOLOGICAL SOCIETY.

Meeting of February 16, 1906.

The President, G. N. ACKER, M.D., in the Chair.

DR. LEWIS read the essay of the evening:

RECENT EXPERIENCE IN GALL-BLADDER SURGERY.

CASE I.—Mrs. B., referred to me by Doctor Boswell' August 11, 1905, was taken to Sibley Hospital suffering from double tuboovarian abscess. I operated on her August 12, removing both tubes and ovaries which were badly diseased. She was married January 27, 1895, was 29 years of age, and had had several children and several miscarriages; her pelvic infection evidently followed one of these. She had suffered cramping pains in the right hypochondrium since she was twenty years of age, until September 28, 1905, when I operated on her again, this time for gallstones, she having recovered from the first operation. These cramps she attributed to indigestion, they being so severe at times as to require the use of morphine. At no time did she have any jaundice. She returned home from Sibley on September 1, 1905, relieved of her pelvic symptoms, but continued to have the cramps from her supposed indigestion. On September 24 she had a bad attack, and Doctor Boswell, having discovered a tumor in her right side, concluded that this had something to do with her attacks. I was inclined to believe from the location of the tumor, which could be easily felt extending up under the liver, that it was an enlarged gall-bladder. She was sent back to the hospital and three large stones were removed, along with several ounces of fluid, from her gall-bladder. I made the mistake in this case of fixing the bladder in the incision before opening it. I placed a drainage tube in the viscus and drained. No bile appeared with the discharge, and on probing several days after the operation I discovered a stone deep down in the duct. We determined to wait a reasonable time for the stone to work out. I learned later that it was a forlorn hope, as

the stone had become pocketed and on account of its size it had to be crushed before I could deliver it. I performed the third operation December 7, removing the entire viscus along with the stone. This patient made a good recovery and no longer suffers from her supposed indigestion.

CASE II.—Mrs. G., age 30, married; had one living child and several miscarriages; she had had most of the diseases of childhood. In December, 1900, she had her first attack with her "stomach;" the pains came on suddenly and seemed to be through the bowels, around her back, running up under her right shoulder blade. This attack was pronounced acute indigestion by the attending physician; about three months later she had another attack of a similar character. These "spells" recurred at frequent intervals, the suffering becoming so great at times as to require the use of morphine. She usually had nausea and vomiting at these times. Last March she consulted and went under the treatment of a well-known stomach specialist. He treated her for "indigestion with the drop stomach," according to the patient. Receiving no benefit after about twenty treatments she again returned to her family physician, Dr. Boswell, for further advice. He looked her over and discovered a tumor lying under the liver on the right side, which was very sensitive to pressure. I saw her with him on October 7, 1905, and agreed, with him, that she was suffering from gall-bladder disease, probably from gallstones. At no time in any of her attacks did she have any jaundice, pain about the right hypochondriac region being her most distressing symptom. We sent her to Sibley Hospital and removed three large gallstones. In this case I found the pyloric end of the stomach, along with the neighboring viscera, very closely adherent to the gall-bladder. This adhesion probably had something to do with causing the dilated stomach. The gall-bladder was stitched to the abdominal incision, after the stones were removed, and drained. She went home in two weeks in fine condition. In December last she developed an attack of acute appendicitis, for which I operated, removing a very angry red appendix; since that time she has been in better health than for years, having gained twenty pounds since her first operation.

CASE III.—Mrs. T., age 35, married; has several children. She has complained of repeated attacks of biliousness, which would last from two to three weeks at a time, accompanied with severe pain about the liver, nausea and vomiting. Three days previous to her operation she had a severe attack of biliary colic, with all the above symptoms of a very severe type. I saw her with Doctor Boswell at Sibley Hospital on January 18, 1906. Previous to this, for several days, she ran a temperature as high, at times, as 102°. There was a good deal of abdominal distention, rigidity of the abdominal muscles and tenderness over the region of the gall-bladder. A distinct tumor could be felt in the region of the right hypochondrium, which extended down into the right lumbar region. I operated

the following day, finding a greatly distended gall-bladder filled with stones and mucus. There were evidences of a local peritonitis, but no signs of a leakage of bile. The adhesions were stronger in this case than in the two others just reported. Why this peritonitis should be present without any escape of bile I cannot explain. She was sent home relieved of her suffering. In this case the bladder walls were very much thickened and the bladder enlarged, so much so that I cut away the distal third of the viscus before suturing it into the abdominal wound. Bile appeared in the dressings on the second day after the operation; a peculiar feature of this flow of bile was that the discharge was much greater at night than in the daytime; it was also appreciably increased after the administration of calomel.

These three cases were in married women; all had borne children and their case histories are very much alike; each had gallstones confined to the gall-bladder and cystic duct. These are the easiest cases for the surgeon to treat. Like appendicitis the most rational treatment in these cases is surgical. Nature attempts to operate on these cases at times; but when she does succeed it is too often at a great cost of suffering and risk to the patient's life. Medical literature presents many cases where gallstones have passed into the peritoneal cavity, having ulcerated through the walls of the biliary tract, causing peritonitis with dense adhesions, crippling the functions of the stomach and adjacent viscera; or a fatal peritonitis or hemorrhage. Obstruction of the intestines has even been known to follow the escape of a large gallstone into the duodenum. In view of all of these possibilities, all gallstones should be removed by the surgeon and one should not depend upon nature to do it. It is my firm conviction that when there are no stones in the common or biliary duct, the gall-bladder should be removed. The only excuse we can have for leaving the gall-bladder is for external communication with the deeper bile tracks. In Case II, I had occasion to open the abdomen for a diseased appendix; having stitched the gall-bladder to the abdominal wall a few months previous, I was curious to ascertain its condition. To my surprise I found it had atrophied to the size of an ordinary lead pencil and felt as hard as a solid cord; the lumen apparently had closed. It has occurred to me that, as the stagnant bile in the gall-bladder furnishes the most favorable condition for the formation of gallstones, and as those of the cystic and common ducts have their origin in the gall-bladder, when we remove this viscus we remove almost all possibilities of stones in these ducts, if not present at the time of the operation. Hence we might argue that if we remove the gall-bladder there would be no occasion for having an outlet for bile through the abdominal wall.

DR. VAUGHAN said that gallstones form in all parts of the biliary tract, even in the liver. Bacteria may enter by way of the circulation as well as by the bile ducts. In the treatment of gallstones the removal of the gall-bladder is not desirable.

If it be gangrenous, markedly diseased, cancerous, or atrophied, it should be removed, but not otherwise, as it is desirable to leave it for drainage. Mayo recommends saving the gall-bladder when possible. It is impossible to drain the cystic duct and tell whether or not the common duct contains stones. In a case of Mayo's the gall-bladder was needed for drainage at a second operation. Jaundice of the umbilicus has been noted. This is a place where jaundice is apt to be seen early owing to the thin skin. He had a case where he opened the common duct; 20 days later there was secondary hemorrhage, causing death in 24 hours. Pancreatic juice may have caused the hemorrhage by digesting some of the tissue.

DR. BALLOCK said that he agreed with Dr. Vaughan, that the gall-bladder should not be removed, but left for drainage; it may relieve the pancreas also. If there be any possibility of the gall-bladder regaining its function it should be left.

DR. STONE said that the question as to when to operate was most important. He operates for local pain and fever recurring repeatedly. He cited a case where after a pad was placed under the patient's back on the operating table he made a change of diagnosis from disease of the gall-bladder to that of the pancreas. The mass became prominent instead of remaining under the ribs. The case proved to be a chronic interstitial pancreatitis.

DR. J. T. JOHNSON said that drainage was not so much needed as is generally thought. The "ideal" operation can frequently be done with safety. He does not believe in removing the gall-bladder whenever the abdomen is opened as is advocated with regard to the appendix.

DR. BOVÉE still believes in the removal of the appendix when the abdominal cavity is opened, but he does not favor this with the gall-bladder. Drainage is needed for infection, and infection is generally present at the time of operation. He believes in drainage by the bile ducts in pancreatitis.

DR. JOHNSON wished to correct Dr. Bovée's impression that he did not drain at all. He does in appropriate cases.

TRANSACTIONS OF THE OBSTETRICAL SOCIETY OF LONDON.

Meeting of April 4, 1906.

The President, DR. DAKIN, in the Chair.

DR. A. W. ADDINSELL read a paper on

CHRONIC INFECTIVE METRITIS,

followed by a lantern demonstration.

The condition is due to infective inflammation originating in the endometrium, and extending into the muscle wall of the uterus. In the cases referred to there was a history of infection following childbirth, miscarriage, gonorrhea, or local interference. In none of the cases was there found any gross lesion, such as the presence of fibromyomata or malignant disease before or after removal by operation. In all, the predominant feature which determined hysterectomy being performed was persistent, excessive, and uncontrollable hemorrhage. Three stages are described:—The *first*, or *early stage*, in which the chief characteristics are perivascular inflammation, small round-cell proliferation around the vessels. A gradual encroachment of round cells along the line of vessels and invading the intermuscular connective tissue. Round-cell proliferation surrounding those mucous glands which lie deepest in the muscle wall. The *second stage* is marked by considerable increase of fibrous tissue. The intermuscular connective-tissue is converted into fibrous tissue; bundles of muscle-fibers are seen in isolated groups, strands of fibrous tissue running in all directions. The arteries are thickened, chiefly in the middle coat, but also in the outer coat. There is increased vascularity. Some of the arteries are almost obliterated. Many are distorted in shape. This is the condition described by Mr. Bland-Sutton as "fibrosis," and by Dr. Palmer Findley as "arteriosclerosis." In the *third stage* there is a still greater increase in vascularity. The fibrous tissue has undergone degeneration. There is marked dilatation of capillaries. The muscle-nuclei take the stain badly. The whole microscopical field looks like an opaque homogeneous mass perforated with innumerable vessels. It is difficult to make out any muscle tissue. The clinical history of these cases was described and the treatment discussed, the conclusion being arrived at that after all the usual remedies have been tried recourse must eventually be had to hysterectomy.

DR. BLACKER pointed out that there were several different conditions all associated with the one symptom of intractable hemorrhage from the uterus. He wished to know if Dr. Addinsell

had taken the precaution to exclude the possible effects of precocity and child-bearing in his cases as etiological factors. He thought that further evidence would be required before they could accept as proved the view that these cases were due to infection. With regard to treatment, steaming the uterus was of the greatest possible value and should always be resorted to before hysterectomy was carried out.

DR. GRIFFITH said that he was not in favor of steaming the uterus in cases of this kind, and that he considered that cases of hemorrhage so intractable as to justify hysterectomy, excluding cases of cancer and fibroids, were exceedingly rare.

DR. EDEN said that he could not accept the view that the changes in the uterine musculature shown by Dr. Addinsell were inflammatory in their nature. The real difficulty in interpreting histological detail in the uterine wall was due to the fact that no precise study had ever been made of the uterine tissues at different stages of the fertile period of life.

DR. MACLEAN read a communication on

A CASE OF ABDOMINAL PREGNANCY IN WHICH THE FETUS
WAS REMOVED SIX MONTHS AFTER SPURIOUS
LABOR AT TERM.

The patient was a married woman, æt. 34, who had not previously been pregnant. She was admitted into the Cardiff Infirmary on February, 17th 1906. The last menstrual period had occurred in November, 1904. Two months later some indefinite discomfort was experienced in the lower abdomen, and a brown vaginal discharge appeared. The patient apparently was then supposed to have been normally pregnant and the confinement had been expected about the last week in August, 1905. Spurious labor occurred towards the end of August, but the pains passed off, the breasts became smaller, and the abdominal swelling also diminished in size. The patient continued in good health until a week before her admission to the Infirmary, when severe pain in the abdomen and back set in, with fever and vomiting. Abdominal pregnancy with recent infection of the sac was diagnosed and the patient was operated on next day. A full-term fetus was removed, showing evidence of putrefactive change. The peritoneal cavity was completely shut off from the sac containing the fetus and was not opened at any time during the operation. There was a pinhole communication between the bowel and the sac. A gauze drain was inserted at the time and subsequently further drainage was provided by incision into the posterior fornix per vaginam. The patient's general condition has much improved since the operation. The abdominal wound is closed.

REVIEWS.

FOOD AND THE PRINCIPLES OF DIETETICS. By ROBERT HUTCHINSON, M.D., EDIN., F.R.C.P., Assistant Physician to the London Hospital and to the Hospital for Sick Children, Great Ormond Street. Pp. 582, with plates and diagrams. Revised Edition. New York: William Wood & Company, 1906.

The second edition of this most interesting and instructive work on food and dietetics differs from the first, chiefly in the elaboration of the chapter on the amount of food required in health and of those treating of diet in disease. The recent work of Chittenden and other American investigators has demanded extensive revision of our ideas of the amount of food needed by healthy persons, and the changes in the chapters devoted to the dietetics of disease have been the outcome of the writer's greater experience. The work deals very thoroughly and entertainingly with the composition, sources, preparation and uses of all classes of foods. The digestion of food is also discussed, and several chapters are devoted to infant-feeding. Many of the artificial and prepared foods described throughout the book are naturally better known in the English market; but the work, as a whole, is applicable to the conditions existing in our own country.

H. D.

DIE KRANKHEITEN DES BECKENBINDEGEWEBES. Unter Mitwirkung von J. A. AMANN, JR., München, O. BUSSE, Posen, und PH. JUNG, Greifswald. Herausgegeben von A. MARTIN, Greifswald. Mit 11 Tafeln und 24 Abbildungen im Text. Berlin: S. Karger, 1906.

This volume is a continuation of a work on diseases of the female adnexa, begun more than ten years ago by August Martin, and is a conclusion of that work. To speak of it as a whole, this book of 360 pages must be considered a master text-book of that special department of gynecological literature of which it treats. Martin selected as co-workers men who cannot be excelled. The anatomy and physiology of the pelvic cellular tissue is dealt with by Jung in a most thorough manner. Special attention is called to the subserosium parauterinum as being most important, because all the uterine blood-vessels and lymphatics, as well as the greater part of the nerve apparatus of the genitals and the ureters, are imbedded in it. The importance of avoiding injury of the superior and inferior ureteric arteries in laying bare the ureter, because of the non-existence of anastomosis between these vessels, is particularly mentioned, on account of the liability of ureteral necrosis if these vessels are injured.

Martin calls attention to the rarity of extraperitoneal peri-uterine hematoma. In 3,000 gynecological patients he had been able to make that diagnosis only three times. The arrangement of the vessels in the loose cellular tissue predisposes to the development of hematoma. Concussion of the lower abdomen, trauma and sudden increase of abdominal pressure may give rise to apoplectiform tearing of the blood-vessels in the cellular tissue. So also may the distended condition of the vessels during menstruation, etc. The chapter on the differential diagnosis of hematoma from hemocele, intra-ligamentous myoma, parametritis, hematometra, etc., shows the ability of the author. The only point on which we may differ is the *invariable* possibility of palpating the isthmic part of the Fallopian tube, when the differential diagnosis is to be made from hydro- or pyosalpinx. Should surgical intervention be indicated, the abdominal operation is favored.

In the chapter on parametritis the importance of varicocele of the broad ligaments is particularly alluded to. Likewise the occurrence of cystitis independent of infection with a catheter. Further, the dislocation of the ureter which may occur in some cases, and Martin mentions an instance in his own practice in which anuria occurred as the result, the patient dying on the fifth day. Affections of the sacrouterine ligaments as the outcome of subacute septic puerperal parametritis has been frequently observed. The subacute forms of parametritis are frequent causative factors of thrombosis of the pelvic vessels and lymphatics. The frequently occurring dilatations of the veins of the lower extremities and chronic edema of the lower extremities may also often be traced to a former puerperal parametritis. In the treatment, the production of local hyperemia, as advised by Bier, is given a prominent place. As a criterion for the treatment of the acute and subacute forms of parametritis, counting of the leucocytes is strongly recommended. As soon as the leucocyte count is persistently more than 10,000, abscess cavities are freely opened in the Greifswald clinic, independent of any other palpatory finding or of evidence of a spontaneous rupture.

In the chapter on hemocele, the pathological anatomy of which is written by Busse, it is demonstrated that the simple extravasation of free blood into the peritoneal cavity is insufficient to cause an hemocele. The clinical part is written by Martin, who is particularly qualified for this because of his immense experience. In the treatment of hemocele from ectopic pregnancy, the expectant plan is largely relied upon, if there is no evidence of renewed hemorrhage or disintegration of the blood, provided the patient is under constant observation where an immediate surgical intervention may be resorted to, should occasion demand it. Vaginal operations for ectopic pregnancy yield a mortality of 5 per cent.

Pelvic peritonitis is undoubtedly the most frequent ailment of the female sexual organs. There is no unanimity of

opinion regarding the symptoms of gonorrheal peritonitis. Severe acute recurrences of pelveoperitonitis are frequently caused by replacements, pessary therapy, the breaking up of adhesions when they are not exposed to sight, and especially cervical dilatation and divulsion.

The book would prove a most valuable acquisition to every physician's library. BOLDT.

SEMMELWEIS, GESAMMELTE WERKE. Herausgegeben und zum Theil aus dem Ungarischen übersetzt von DR. TIBERIUS VON GYOERY, Privatdozent an der Universität zu Budapest. Mit Unterstützung der Ungarischen Akademie der Wissenschaften. Jena: Verlag von Gustav Fischer, 1905.

For any one interested in the evolution of antiseptic obstetrics no more fascinating work than this can be found. It shows the tremendous opposition that Semmelweis encountered in the promulgation of the etiology of puerperal fever and his method of preventing it. His open letters to the most eminent obstetricians of that time show his sincerity and unselfishness in laboring in the interest of child-bearing women. It also clears up the erroneous but prevalent idea that this pioneer thought that puerperal fever was caused only by infection from the dead body. It likewise settles the question of priority. Through him the compulsory washing of the hands prior to the examination of any pregnant or puerperal woman, in a watery solution of chloride of lime, after thorough washing with soap and water, was begun in the lying-in department of the Vienna General Hospital in May, 1847. It was also prohibited that the accoucheur should come in contact with any dead bodies, and that the attendant should wear clothing which might possibly be infected. On the first division, in 1846, there were confined 3,354 women, with a mortality of 459; in 1847, 3,375, with 176 deaths; in 1848, 3,356, with only 45 deaths. In 1856 to 1857 the obstetric clinic was supplied with such soiled bedlinen that puerperal fever again made its appearance. The moment that clean bedclothes were supplied the infections ceased. In 1858 a similar occurrence took place, with a like result. The latter time it was through the negligence of a nurse. In November, 1847, the atmosphere of the lying-in room of the first obstetric division was impregnated with the exhalations from a carious kneejoint which caused puerperal fever in the woman. In the third stage of labor infection may be caused by the genitals, wounded by the expulsion of the child, coming into contact with utensils which have been contaminated. Unclean bedlinen caused such an occurrence under these circumstances on two occasions. The author shows that the idea that puerperal fever was prevalent more at certain times of the year, and that its existence was due to climatic influences was erroneous. He further shows the necessity for proper ventilation, and the separation of well puerperal women from those who were ill. He shows the necessity for properly

disinfected hands, instruments, linen, sponges, basins, etc. He contends that lying-in departments should not be a part of a general hospital. He further insists that if his ideas were carried out in prophylaxis, the mortality would be probably reduced to one in 400 instead of, as was the case where prophylaxis according to him was not used, every third or fourth woman being lost in the institutions where there was an anatomical department. He protests most fervently against those who allege that he taught that all cases of puerperal fever were due to cadaverous infection. He maintains that in the vast majority of instances of puerperal fever, the infection producing agents are introduced from without, and among these sources the cadaver is one, but that this is not the only source. He admits the possibility of isolated cases of auto-infection. These cannot be prevented, but there are only few such instances. He handles those who are opposed to his views without gloves, calling their teaching murderous and them ignorant and accessories to murder. Siebold and Scanzoni are particularly harshly dealt with. The French school he treats with the utmost contempt. He openly states that all professors who continue to teach as they had and were teaching, instead of teaching the prophylaxis as had been taught by him, and as he had proved beyond an iota of doubt to be correct, should be deprived of their positions. He would designate the disease as "resorption fever of woman during the propagation period." In addition to the obstetric writings of Semmelweis, all thoroughly digested and full of abundant proof as to the correctness of his views, and numerous letters of appreciation of his teachings from others, there are added his writings on gynecological subjects. In this department is conspicuous his refusal to accept stenosis of the cervical canal as an etiological factor of dysmenorrhea, except in rare instances. The work is one of 604 pages, clearly printed on good paper. We can recommend it to all medical men as unusually interesting reading matter. BOLDT.

BRIEF OF CURRENT LITERATURE.

OBSTETRICS.

Dangers of Ventrofixation.—A. Calman (*Zent. f. Gyn.*, Feb. 10, 1906) describes a case of twin pregnancy after ventrofixation in which the position produced in the uterus rendered a natural delivery of the children impossible. The patient had been operated on for an ovarian cyst on the right side, and at the same time the retroflexed uterus was attached to the anterior abdominal wall. The patient's previous labor had been easy. After the operation she had pain and hemorrhage, had two abortions, was curetted, and then had severe hemorrhage during

the pregnancy, with crampy pain, backache and weight in the abdomen. Below the navel and to the right the abdominal walls were much distended. The uterus was bent toward the right and a sort of diverticulum extended deep into the loin. The right round ligament was felt to be much stretched, while the left could not be found. There was twin pregnancy combined with torsion of the uterus. The fetuses were both lying across the pelvis and neither became engaged. The posterior lip of the cervix could be felt, being drawn far up above the promontory. It became necessary to deliver by version, and thus two living children were obtained with some difficulty, as fortunately the foot of one child came down into the pelvis. The position of the uterus prevented any part of either fetus from becoming engaged, and had not version succeeded, a Cesarean section would have been necessary. The right side of the uterus was much stretched, while the left took almost no part in forming the cavity for the fetus. The author questions whether one ought to perform an operation that so changes the position of the uterus.

Symphyseotomy and Pubiotomy.—W. Stockel (*Zent. f. Gyn.*, Jan. 20, 1906) compares the operations of symphyseotomy and pubiotomy with reference to their results and the indications for the performance of each operation. According to some authors symphyseotomy should be abandoned on account of its dangers and the bad results that have been obtained. Gigli represented symphyseotomy more unfavorably than it should be considered. If the soft parts and the bone heal by primary union there are no unfavorable results; if infection and pus formation set in there is great danger of sepsis and invalidism. The danger lies in an open, infected wound. Gigli's operation is no better; infection is quite as easy as in symphyseotomy. It is only when a subcutaneous operation is performed that the dangers are lessened by dividing the bone instead of the joint. This modification creates a new operation and is due to the ingenuity of Döderlein. To enter the saw of Gigli by a small puncture, so that the wound is practically subcutaneous, is a great improvement in the technique. Bumm enters the needle the breadth of two fingers from the clitoris, between the large and small labia in an upward direction. The first finger of the other hand passes into the vagina, while the needle hugs the bone. The saw of Gigli is entered attached to the eye of the needle and drawn downward. Bleeding occurs only from the upper wound, from the veins behind the bone, and is stopped by slight compression. Even if the needle should enter the bladder the results are not dangerous, as the bladder soon heals. Subcutaneous pubiotomy is entirely without danger and the instruments are not complicated, and the author believes that it may be done in a private house as well as in a hospital. Symphyseotomy, on the other hand, should not be done in a private house. An operation that is undertaken in the interest of the child

must result in the delivery of a living child, otherwise it is better to perforate the child's skull in the interest of the mother. The important question is whether subcutaneous pubiotomy gives the child a better chance than symphyseotomy. The author gives the lowest diameter that is practicable for pubiotomy in a rachitic pelvis as 8 cm., anything less proving too narrow for delivery of a living child. In general contraction of the pelvis, 8.5 cm. is the smallest. In symphyseotomy there is a greater enlargement of the diameter than in pubiotomy by 1 cm. After separation of the symphysis the pelvis springs apart so that it is necessary to rotate the thigh inward to prevent tearing of the bladder. After sawing the bone this springing action does not take place; there is a separation of only a finger's breadth between the two parts of the bone. The separation is about the same in the two operations, but it requires more strength to accomplish the separation in pubiotomy. The author endeavored to devise a subcutaneous symphyseotomy, but failed. Where a one-sided pubiotomy is not enough a double operation might be done so as to obtain more room. Experience must show whether in such cases the bone becomes necrosed and whether the muscular power will prevent dislocation of the fragment.

How the Increase of Width Is Obtained in Pubiotomy.—Wilhelm Rosenfeld (*Zent. f. Gyn.*, Jan. 20, 1906) has measured as accurately as possible the increase in width to be obtained in the operation of pubiotomy, and gives his results. Every pelvis by its natural elasticity and the yielding of its articulations has a certain ability to increase its conjugate by about 6 mm., which may be added to the increase in pubiotomy. The separation in the two operations of symphyseotomy and pubiotomy is about the same, that is, about $1\frac{1}{2}$ cm. The method of widening differs in different varieties of contraction. In the flat pelvis both oblique diameters may be increased, while in the generally contracted pelvis the opposite oblique diameter is increased less in width than that of the side operated on. Therefore the pubiotomy is done on the side in which the biparietal diameter of the head will pass. In generally contracted pelvises the widening comes at the expense of the sacroiliac joint of the operated side. In symmetrically contracted pelvises the increase is on the side of the operation, while in a flat pelvis it is equal on the two sides.

Obstetrical Dilatation of the Cervix.—Dührssen (*Surg., Gyn., and Obst.*, Mar.) very strongly condemns the use of Bossi's method as being dangerous and unsurgical. He advises deep cervical incisions in cases of effaced cervix, vaginal Cesarean section in cases of ineffaced and rigid cervix, and metrectomy with automatic traction in cases of ineffaced but dilatable cervix.

Cause of Rupture in Tubal Pregnancy.—Romolo Costa (*Ann. di Ostet. e Gin.*, Jan., 1906) advances the question of the real

cause of the rupture of the tube in tubal pregnancy. He has made very careful microscopical and macroscopical examinations of the specimens in two cases of tubal pregnancy, in one of which there was no hemorrhage and the relations between the maternal tissues and those of the fetus were well preserved, while in the other there had been so much hemorrhage that the relations were completely altered. In the latter case there was marked degeneration of the tubal tissue at the seat of hemorrhage. Also the villi seemed to have penetrated the tissues of the tube. It has ordinarily been accepted as a fact that the primary cause of the rupture is hemorrhage into the tube, so distending it that the walls are torn apart. The author thinks that there must be another hidden cause, which he believes to be a degeneration of the muscular tissues of the tube due to the action on its tissues of the villi of the ovum. Such action is destructive, and when the maternal tissues are not sufficiently resistant, and the attack is rapid, the tissues are so changed, so nearly destroyed that slight hemorrhage will cause rupture. The circulation is poorly developed, the vessels are of small caliber and the nutrition is poor, which facilitates rupture. A fact of importance is that rupture is more liable to occur in the first month of pregnancy, when the relative size of the ovum is less; while later, when the ovum has grown more, rupture becomes less frequent. Thus the hemorrhage is only the determining cause, while the underlying degeneration lays the foundation for its action.

Extramembranous Pregnancy.—Walter Pfeilsticker (*Archiv f. Gyn.*, Bd. 77, H. 3) cites from Winckel's Handbook eighteen cases of hydorrhea of the gravid uterus in which the cause of the flow was rupture of the ovisac with passage of the fetus outside of the membranes. No abortion occurred, but the pregnancies went on to term. Some of these cases were extra-amnial, others extrachorial. To these eighteen cases the author adds three others from literature. In some cases there is a flow of blood from the uterus throughout the pregnancy, while in others there is little blood and more watery fluid, or the flow does not continue through the whole pregnancy. Labor is usually premature, since the fetus has not room for its development. The author observed a case in a multipara, in whom there was bloody, watery flow from the uterus through the whole pregnancy, ending with premature labor, and the delivery of a weak child that died soon after birth. There was no bag of waters and no flow of amniotic fluid during labor. In the after-birth there was a disproportion between the size of the fetus and of the sack, and a tear in the membranes at the pole of the ovum. The author believes that the cause of the rupture of the ovisac was an endometritis which thinned the sac so that the pressure of the contained fluid caused it to rupture. A trauma from without may be the immediate cause of the tear in some cases. An endometritis would cause a weakness of the chorion because it takes its nourishment from the decidua.

The rupture begins without; first the decidua and chorion burst and then the amnion is unable to sustain the weight of water, and that also ruptures. The condition may begin like an ordinary abortion which becomes stationary and hydrorrhea ensues. Finally the degeneration of the chorion brings about rupture. Here bleeding takes place first. In other cases the watery fluid comes first, when the chorionic villi are too much atrophied to cause bleeding at first, and later villi that are in more normal condition begin to bleed. Another cause of this rupture may be an attempt at criminal abortion which has only partially perforated the membranes and has allowed the development to go on. In this case the rupture comes from without inwards.

Rupture of the Uterus.—Ruptures of the uterus during labor occur, according to Thomas Wilson (*Lancet*, Feb. 3) more frequently in multiparæ than in primiparæ, in the ratio of more than 8 to 1. The greater proportion of these cases depend upon mechanical difficulties in the passage of the child, of which the most common are contracted pelvis, transverse presentation and hydrocephalus. Exostoses and hard tumors may cause rupture from without inward. Hardness and rigidity of the cervix, excessive size and hardness of the head and body of the fetus and presentation of the placenta are other causes. The rupture may be due to direct violence or the external force may merely hasten it. When labor is protracted one must watch carefully for the symptoms of threatened rupture: a pulse that does not drop below 100 between pains, anxious expression of countenance, restlessness, groaning even between pains, and a rise of temperature to 101 or more. When the contraction ring runs very obliquely across the abdomen and the round ligament of one side only is very tense and easily felt, it may be inferred that the lower segment is dangerously stretched. When rupture actually occurs the symptoms may come on with startling suddenness or may be gradual. In a typical case an intense local pain is experienced at the height of a labor pain and symptoms of collapse rapidly set in. In most cases blood escapes from the vagina. The site of the rupture is notably tender; the fetal parts presenting recede and become more movable, or may disappear entirely. When the fetus has escaped into the peritoneal cavity a change in the form of the abdomen is observed: the uterine fundus disappears, the abdomen becomes broader, and the fetal parts can be felt with remarkable clearness. Fetal heart sounds and movements cease. These symptoms more often come on gradually or may be entirely absent, the patient dying a few days after delivery without having shown the usual signs of rupture. Two rules must be borne in mind in treating threatened rupture. First, ergot should never be given until the child is delivered. The second is that in a case of obstructed labor, where the waters have escaped and the signs of tonic contraction of the uterus are

present version must not be performed. When the signs become marked, immediate delivery must be effected. When rupture has occurred the child may have to be taken through the vagina or abdomen. When the head presents, perforation and craniotomy should be performed. If the child has mostly or entirely escaped into the peritoneal cavity, celiotomy is indicated. When the patient is probably not infected and other conditions are favorable the laceration should be treated on ordinary surgical principles with a view to its union; when there is a probability of infection the uterus should be removed and free drainage of the peritoneal cavity provided for.

Puerperal Eclampsia.—Roger de la Harpe (*Four. Obst. and Gyn.*, Feb.) outlines the treatment of eclampsia in the Rotunda Hospital, Dublin, as follows: Half a grain of morphia is given hypodermically, and repeated, if necessary, in quarter grain doses, every two hours, up to the maximum total of two grains in 24 hours. When possible, large quantities of water are given to drink, or when this is impossible the water is given by a stomach tube. By this means the stomach is washed out with three or four pints of hot water. Half a pint of water is left in the stomach and to this is added, still through the tube, two ounces of castor oil and three or four drops of croton oil. The patient should be placed on her side and a rectal tube introduced and the colon flushed until all fecal material is removed, about a pint of saline solution being left in the intestine. The patient should now be wrapped in warm blankets and poultices placed about the loins to relieve the congestion of the kidneys. The patient should be kept on her side to facilitate the flow of mucus from the mouth. No food should be given by mouth, nor should a gag be employed. When the pulse becomes feeble and rapid, digitalis is injected, and for slow and sighing respiration atropine is given, with saline infusions in very serious cases. The only local intervention permissible is the application of forceps when the head is at the vulva. By following this line of treatment there have been only 12 deaths in 71 cases.

Use of Scopolamine in Eclampsia.—Albert Laurendeau (*Four. de Med. et Chir.*, Apr. 14, 1906) recommends the use of injections of scopolamine hydrobromide in doses of one-fiftieth of a grain, combined with one-fifth of a grain of morphine and fifteen drops of fluid extract of veratrum viride, in eclampsia, administered by hypodermic as soon as the patient is seen. The drugs should be injected deeply into the thorax. After an interval of one hour and a half, if attacks continue, repeat the dose. After another hour and a half, attacks being continued, repeat the same dose, less five drops of veratrum viride. Further than this the dosage should not be continued, as it should have done its work by this time. To support this treatment he describes two cases of eclampsia. In the first the labor was completed, but there was headache, slight amaurosis and a large amount of albumin in the urine, with a single attack

of convulsions. The treatment was at once resorted to with the result that there were no further convulsions and complete recovery ensued. In the second case the convulsions were of frightful severity, constantly repeated and ending in complete coma. The treatment at once lessened the severity of the attacks, and they ceased entirely after seven hours. Two days later the labor terminated with a normal delivery. After the cessation of convulsions the patient had an attack of mania, which lasted a few hours. The pulse soon shows the influence of the veratrum by becoming softer and slower. The vascular tension is an important factor in the production of the convulsions, combined with autointoxication, and the two result in a hyperexcitation of the nerve centers, which manifests itself by intermittent and involuntary discharges of nervous force. Scopolamine and veratrum respond exactly to the indications, the first calming the nerves, the second lowering the arterial tension.

Pernicious Vomiting of Pregnancy.—J. Whitridge Williams (*Johns Hopk. Hosp. Bull.*, Mar.) divides this trouble into three varieties: reflex, neurotic and toxic. The reflex is dependent upon the existence of abnormalities of the genital tract or ovum and may be cured by their correction or removal. The neurotic type depends upon the existence of a neurosis without demonstrable lesions, and is more or less allied to hysteria. It is the most frequent variety of serious vomiting and can be cured by suggestion or a modified rest cure. The toxic type is associated with characteristic changes of metabolism and in fatal cases, at least, with lesions in the liver, analogous to those observed in acute yellow atrophy. It may be acute or chronic in form. In the reflex and neurotic vomiting there are no manifest changes in the urine, while the toxic variety is characterized by a marked decrease in the amount of nitrogen excreted as urea and a characteristic increase in the amount excreted as ammonia. The toxic type is diagnosed by examination of the urine, the reflex by careful bimanual examination of the genitalia, and the neurotic after exclusion of the other varieties. The prognosis is excellent in reflex and neurotic vomiting, provided appropriate treatment is instituted, so that the termination of pregnancy is rarely indicated. In toxic vomiting, on the other hand, a fatal issue can be averted only by the prompt induction of abortion, and even then the prognosis is dubious.

Placenta Prævia.—Richard Warren (*Lancet*, Feb. 3) believes it to be necessary in cases of ante-partum hemorrhage, in which the os will not admit the finger, to ascertain by bimanual and abdominal examination, whether or not the placenta is implanted on the lower segment. Labor, if not in progress, should be induced immediately. Should the os not admit a bag or allow the performance of bipolar version, it must be dilated till one of these modes of treatment can be adopted.

When the os is of suitable size, a bag is inserted. It matters little whether this be pushed through the placenta or membranes or between the uterus and placenta. Immediate treatment is now complete, as slight traction on the bag or on the leg of the fetus will control the hemorrhage. After the bag is expelled, unless the head or breech is driven down by strong pains, internal version is the best course, since flooding may occur. In these cases the insertion of the arm for version acts as a plug till the fetus is turned and can, in its turn, act as a tampon.

Etiology of Fatal Post-partum Atony.—Ed. Martin (*Monat. für Geb. u. Gyn.*, Feb., 1906) illustrates his subject with the account of a case of fatal atony after labor, which he believes was the result of an endometritis and metritis which had existed before pregnancy began. The patient had been delivered twice, once normally, but two years previously by forceps, of a dead child. During the pregnancy in question she had lost blood during the last seven weeks. Four days after labor had begun the contractions continuing very weak, a discharge of ill-smelling water from the uterus began, and rise of temperature ensued. A foot came down and an attempt was made to stop the bleeding by detaching the placenta. This was found to be impossible, the hand entering a flaccid cavity, the walls of which were covered with rough, felt-like material, and seemed to be as thin as paper. Only the region of the left tube showed some disposition to contract. The placenta was adherent to the uterine wall. No contraction could be brought about by ergot, massage, or hot douches. The patient succumbed to hemorrhage in spite of all efforts. The autopsy showed the uterus like a lax bag, quite uncontracted, and the placenta could not be separated from the muscle. Microscopical examination showed a chronic inflammation with small-celled infiltration. There were, at two points, small abscesses between placenta and uterus. There was a chronic metritis with destruction of the muscle fibers, and hyaline degeneration of the placental masses. The author believes that there was, at the time of the fertilization of the ovum, a marked grade of inflammation of the uterine wall. The infiltration was an attempt, on the part of the uterus, to separate the necrosed portions. The mucous membrane was inflamed also, and this resulted in degeneration of the chorionic villi. Still the placenta was able to carry on its functions. The atony began in the previous labor and resulted from an insufficiency of the uterine muscle. The author believes that metritis and endometritis of long standing are etiological factors in cases of atony after labor that are sometimes fatal.

Puerperal Septicemia Treated by the Streptococcic Serum of the Institut Pasteur.—A. Bolognesi (*Bull. gén. de Thér.*, Mar. 30, 1906) recommends the use of antistreptococcic serum as it is produced at the Institut Pasteur. This serum seems to differ from the serum of Marmorek in its effects, and it has

been used at the Baudelocque Clinic with some success. It is the serum of Roux and should be used in large doses. From 40 to 80 c.c. may be injected at once, on three successive days, without any bad results. He cites the case of a very feeble woman, delivered by high forceps, with a rupture of the perineum by the aftercoming shoulders. The delivery was aseptic, but there ensued bad-smelling lochia, followed by formation of a false membrane over the vulva, which was adherent like that in diphtheria. Nausea, diarrhea and tympanites ensued, and cold applications to the abdomen with antiseptic intra-uterine douches had no effect, although the author was able to assure himself that the uterus was entirely empty. After injections of the Roux serum, although the temperature remained high, the false membrane separated as diphtheritic membranes separate under the influence of the Roux-Behring serum. Profuse perspiration set in two days after the last injection, and temperature fell to normal on the third day. A complete recovery occurred, although pseudomembranous puerperal infection is almost always fatal. This treatment should be tried in such cases; it is easy, harmless and effective. It acts locally on the membrane and generally on the septicemic process.

Surgical Treatment of Puerperal Infection of the Thrombophlebitic Form.—Giuseppe Guicciardi (*Ann. di Ostet. e Gin.*, Jan., 1906) calls thrombophlebitic infection in the puerperal state a rare form of infection. Initiated in the uterine cavity it passes from the venous sinuses to the periuterine veins, producing septic thrombi, and later becomes a generalized pyemic process. It should be kept entirely distinct from the other forms of infection, as to diagnosis, prognosis and also therapeutics. The prognosis is always grave, due to the general infection which takes place with the formation of local foci. The symptoms are frequency of pulse independent of the severity of the rise of temperature, a pyemic temperature curve, intense chills repeated throughout the disease, general bad condition and anemia, peculiar character of the pain in the abdomen, and recognition of the thrombosed veins as resistant cords by bimanual examination. Bacteriological examination of the blood is of little value, both because it is inconstant and contradictory in results. The leucocyte formula has only a relative value. Ordinary obstetric care is valueless. There are precise and rational indications for surgical interference. Hysterectomy, either vaginal or abdominal, is not to be advocated; resection of the thrombosed veins is dangerous; simple ligation is the best method of surgical treatment. This results in disappearance of the local infective processes and of pain. The best time for intervention is the twentieth day after labor.

The Return of Menstruation After Abortion.—Bernard Englander (*Zent. f. Gyn.*, Feb. 17, 1906) tells us that there have been but few accurate observations made as to the date of the return of normal menstruation after an abortion. It is of value

to the obstetrician to know when a flowing after an abortion may be considered to warrant interference and when it may be regarded as the return of the normal menstruation. The regeneration of the uterine mucous membrane has been stated to occur after a period varying between a few days and some eight weeks, according to the observer in question. The author examined 57 cases with a view to ascertaining the time of the normal return. He has noted especially in each case whether the usual interval between menstrual epochs before the abortion was three or four weeks. Of 57 cases of abortion during the first four months of pregnancy he found that in 36 menstruation occurred in four weeks from the abortion; in eight cases it occurred in the fifth week; in six, at the end of five weeks; in two, in the sixth week, and in four, after six weeks; in one case it occurred in three weeks, the regular interval being three weeks. Four weeks, therefore, seems to be the average time for the return of menstruation. We find that the uterine mucous membrane returns more quickly to its normal function after abortion than after labor. When irregular bleeding occurs after abortion this should not be considered as a normal menstruation, but probably some part of the membranes has been left behind.

Syphilis of the Placenta.—V. Wallich and C. Levaditi (*Ann. de Gyn. et d'Obst.*, Feb., 1906) report the examination of thirteen placentas, with a view to determining the presence of spirochetes in the syphilitic placenta. In six of these cases syphilis was established by its presence in one parent or in the infant itself. In the others it was only suspected. The syphilitic placenta is very large and occurs most frequently in hereditary syphilis, or in an infection of some duration. The cotyledons are large and separated by deep sulci. It is pale in color and friable. There are changes in the villi; the mucous tissue is hypertrophied or edematous, with arteritis extending to all the tunics of the vessels. Spirochetes were found only in the placenta from undoubted cases of syphilis. They were especially noticeable in a case in which the father had syphilis, the mother showed no signs of it, while the infant had pemphigus and died on the second day after birth. Spirochetes were numerous in the coats of the vessels on the fetal side of the placenta and in the mucous tissues of the villi. There were very few in the maternal side of the placenta. It is to be noticed especially that the spirochetes are perivascular as they are in the organs of new-born syphilitics and in chancres.

Significance of Hyperthermia with Slow Pulse in the Puerperium.—C. Merletti (*La Rif. Med.*, March 17, 1906), from the study of about one thousand cases during the puerperium, deduces the conclusion that in cases in which the rise of temperature is not accompanied by an increase of pulse rate the fever is not to be ascribed to genital infection. Such febrile symptoms are due to intercurrent diseases, to gastrointestina

disturbances, to anomalies of lactation or of the lochia, or to nervous conditions. In these cases the pulse does not follow the rise of temperature, remaining at the normal rate, or even being slower than normal. In cases of true infection of the genital organs the pulse rises in proportion to the temperature. This occurs whether the infection is severe or only slight in nature, and in whatever portion of the genital tract the infection takes place.

Lactation and Menstruation.—Karl Heil (*Monat. für Geb. u. Gyn.*, March, 1906) has made observations on the relation of lactation to the return of menstruation in 200 women, of whom 125 menstruated during lactation, that is 62.5 per cent. These women had 540 children while under observation, of whom 41 were not nursed. Of 478 lactation periods there were 234 with menstruation present, that is, 48.9 per cent. Combining these results with those of other authors cited, the author finds that about one-half of all women menstruate during lactation. As the number of pregnancies increases, the liability to menstruate during lactation increases also. Menstruation does not seem to be an indication to wean the child, nor is there a liability to atrophy of the mammary glands after menstruation begins. No good reason for the return or continuance of menstruation during lactation can be given. A considerable number of women menstruate during one lactation and do not in the next. In all probability the women who menstruate during lactation represent the normal type, rather than those who have amenorrhea.

Aptitudes for Marriage from the Physical, Moral and Social Points of View.—A. Pinard (*Ann. de Méd. et Chir. infant.*, Mar. 15, 1906) considers the subject of suitable marriages as of the greatest importance to the evolution of the human race. Reproduction is the true object of marriage. It should not be considered as a convenience, nor should it be a matter of simple inclination. On the other hand, it should not be without love, and the woman should have perfect freedom to refuse to procreate if she finds her husband physically unsuitable. The woman's life he divides into three periods. The first is a period of preparation; the second is that of fertilization; the third, of decline. Too early fertilization results in a normal infant, but the child fails to develop as well as normally, and more of such infants die than should do so. The mortality among such young mothers, also, is greater than among fully developed ones. Late fertilizations tend to the production of fibroids of the uterus. Such late fertilization is often voluntary, due to the determination to have few children, and such voluntary sterility is a predisposing cause of fibroids. The best time for marriage is only 20 to 40, the age of fertilization. The author believes that we should consider whether after bringing children into the world the mother is going to be able to properly support them and bring them up; if she is not going to do so he believes that it is better that she should be voluntarily sterile.

GYNECOLOGY AND ABDOMINAL SURGERY

Radical Operation for Cancer.—John G. Clark (*Univ. Penn. Med. Bull.*, Jan.) finds that results following radical operations for cancer of the uterus have left little in favor of the extensive dissection of glands with the largely-added mortality that must necessarily follow this step from shock, infection and other complications. More is lost than gained in the radical operation. The writer's rule is to remove all possible tissue in the vicinity of the primary site of the growth, using the cautery rather than the knife and not prolonging the operation by a search for glands.

Histological Changes in Myomata in Their Transformation into Fibroid Tumors.—Ellis S. Allen (*Univ. Penn. Med. Bull.*, Mar.) finds that there is always a certain amount of elastic tissue in uterine myomata, either in normal amount and relations in the blood-vessel walls or else in the tumor tissue, where it is distributed among the bundles of muscle along with fibrous tissue of such septa and muscular investments. Vascular changes of the type of fibrous and elastic hyperplasia are common in such tumors, leading to the thickening of their coats and eventual obliteration of the vessels, and increasing the connective tissue framework of the tumor in the vicinity of the affected vessels. Probably as a result of these vascular changes, this excess of elastic tissue in the surrounding tissue deteriorates and eventually disappears. Probably the original muscular elements of the tumor also atrophy, degenerate and necrose, probably from the same cause, and finally disappear as muscle spindles. The character of the tissue and the relative paucity of fiber-forming young elements is consistent with the idea that the fibrillar tissue of the final uterine fibroid is in a large part not true fibrous tissue, and that the general process of transformation is one of retrogression rather than progression.

Indications for the Removal of the Adnexa in Hysterectomy.—Giovanni Miranda (*Arch. di Ost. e Gin.*, Feb., 1906) makes a very careful review of the literature on the subject of conservative surgery of the adnexa and gives his conclusions thus: Conservation of the adnexa in operations for removal of the uterus has only the appearance of conservation of the ovaries and is not without disadvantages. The operation of hysterectomy should be accomplished with the least danger and greatest simplicity. If the ovary be normal it is very simple to leave it. In most abdominal operations the removal of the ovary, which is already diseased, renders the operation quicker and easier. In such cases one should not be bound by theory, which does not conform to the facts of the case, but should sacrifice, without remorse, organs that present no utility when preserved. The objections to the ablation of the ovaries depends on disturbances of the vasomotor system, of the metabolism, as in deposition of adipose tissue, and on psychical

disturbances due to cessation of menstruation. One of the arguments for conservation of the ovaries is based on a supposed internal secretion of the ovaries, the existence of which is by no means demonstrated. The disturbances due to the absence of the ovaries seldom become of an alarming nature. The deposition of adipose tissue always occurs after the climacteric, even when this comes on normally. The question of the absence of sexual feeling after ablation is difficult to decide. Many women never have much sexual feeling, and hence assume it to please the husband. As much as was natural to them remains after removal of the ovaries. Psychological disorders are not worse than after a normal climacteric. Atrophy goes on slowly, and the intensity of the climacteric is somewhat less than when the entire ovaries are removed. Inconveniences of conservation are that the operation is rendered more difficult by the attempt to leave the ovaries; the menstruation that continues is more painful than the natural flow; there is danger of pelvic hemorrhages; adhesions cause new sufferings; and all these dangers are risked to secure a slower climacteric. The author considers that the dangers outweigh the advantages of conservation of the ovaries.

Ovarian Tumor.—According to C. C. Norris (*Univ. Penn. Med. Bull.*, Jan.) one in every four to six cases of tumor of the ovary is malignant, and this fact warrants the treatment of all cases as malignant until proved otherwise. The operative mortality in cases of malignant disease of the ovary should not be above 12 per cent. All cases should be operated upon at once unless there is some strong contraindication to the same. An exploratory laparotomy and the removal of ascites will make many cases more comfortable, and should certainly be performed when there is any doubt whatever about the malignancy. All ovarian tumors should be examined microscopically. Parovarian cysts are far less dangerous than true ovarian cysts. Next to malignancy, torsion is the most frequent and dangerous condition encountered.

Hematoma of the Ovary.—This disease, according to Smallwood Savage (*Brit. Gyn. Jour.*, Feb.) occurs in the first half of menstrual life; it tends to be bilateral and not to be associated with gonorrhea or tuberculosis. It may be caused by certain forms of septic infection, but more evidence on this point is needed. The onset may be acute, but the pain becomes chronic and is located in the lower abdomen. Menstruation is not affected, though there may be slight menorrhagia and dysmenorrhea. There is marked disorganization of the ovary, converting it into a firm, non-collapsible shell of ovarian tissue of varying thickness, due to edema and interstitial extravasations of blood. Broad adhesions to surrounding parts are always present, being an indication of inflammation of a more or less severe nature. The Fallopian tubes often show gross changes. The writer divides this disease in two classes, hematoma of the

Graafian follicle and hematoma of the corpus luteum. The first class results from a multiple and premature ripening of Graafian follicles due to an increased amount of blood in the ovary. An outpouring of blood takes place into these follicles from the vessels of the theca interna, so that the cysts unite, and being immature the normal retrogression of the follicle does not take place and a blood cyst remains. Class two is due to hemorrhage occurring during the retrogression of the Graafian follicle. The lining may show either fully developed or retrogressive lutein cells or else a fibroblastic tissue that has displaced or is in the process of displacing them.

Complications of Ovarian Fibromata.—O. Guelliot (*La Presse méd.*, Feb. 28, 1906) tells us that ovarian fibromata are generally classed as benign tumors, but that there are complications that render them serious. There are several anatomical varieties of such tumors; in some cases the ovary has been entirely replaced by the tumor, while in others it develops eccentrically and leaves some tissue unchanged in the ovary; in some cases the tumor is developed at one side of the ovary under the peritoneum, and may become separated by a pedicle which may be twisted and cause serious complications. An ovarian fibroid may all at once take on the characteristics of a malignant growth; it increases rapidly in size, ascites and edema of the legs develop, and the patient loses flesh and strength. Such cachexia should not prevent an operation, as the tumor has not really become malignant. Again, such tumors may by their great size cause serious pressure symptoms, or may become inflamed, or thrombosis may occur. These tumors occur in very young women as well as in more mature life.

Bier's Suction Treatment in Gynecology.—Kroemer (*Zent. f. Gyn.*, Jan., 27, 1906) describes the use of the suction treatment in various uterine conditions and gives what he considers to be the indications for its use in gynecological troubles. He believes that the hyperemia which is produced by the action of the vacuum is not altogether passive. He would distinguish between acute and chronic conditions in the use of this treatment, especially the results of chronic inflammatory processes. In acute processes one may hope for benefit by abstraction of secretion and by hastening the appearance of the leucocytes at the periphery. He cites a case of septicemia in a very anemic subject in which the chills began on the ninth day, and the condition seemed to be due to a deep cervical tear that had become infected. The suction method was applied after the failure of the usual treatment and seemed to localize the septicemia and limit it so that the chills soon ceased and the patient quickly was on the way to recovery. There was produced at once a profuse secretion from the cervix. The author believes that there was thrombosis of the veins on the side of the cervical tear, and that the process was localized and limited by the treatment. He advocates the use of suction in acute puerperal af-

fections to learn more of its value for such conditions. Endometritis and metritis should be favorably influenced. A second group of conditions in which its value may be shown is in the treatment of the results of chronic inflammatory processes in the genital organs. The suction method is a great addition to the measures for conservative treatment. It produces any desired grade of hyperemia of the organs. It has the same effects as hot air or douches. Chronic congestion is relieved and a feeling of lightness is at once experienced by the patient. Scarification of the surface gives a more marked effect by abstraction of blood from the part. Involution of the uterus is hastened. It is of value in hardening from inflammation, as well as in catarrhal endometritis. After emptying any pus pockets in the pelvis the suction method is of value in removing the infiltration remaining.

A Means of Limiting Catheter Cystitis.—R. Gersuny (*Zent. f. Gyn.*, Jan., 27, 1906) has devised a new form of catheter for use in women, which he believes will aid in lessening the number of cases of cystitis from the use of the catheter after operations and after obstetrical interference. He believes that the cystitis is generally due to some form of trauma to the lining of the bladder in the use of the catheter, and he sees the occasion of the trauma in the too rapid emptying of the bladder, so that the mucous membrane is sucked into the lateral eye of the catheter. His modification of the glass catheter has a shoulder at about its middle, six centimeters from the vesical end of the instrument, which prevents the possibility of introducing the instrument too far into the bladder. The lumen of the catheter is also made smaller than usual, so that the stream of urine is small and the bladder is more slowly emptied. He has made use of this instrument in thirty-five consecutive cases with only one slight case of cystitis, and four of urethritis which produced no cystitis. In some of these cases it was necessary to introduce the catheter a considerable number of times before the urine could be passed naturally.

DISEASES OF CHILDREN.

Pseudo-uremia of Childhood.—W. H. Birchmore (*Med. Rec.*, Jan. 27) describes a group of cases somewhat resembling uremia. The symptoms common to all the cases observed were: severe headache, crying and ill temper, in older patients a chill. After an hour or two of headache, sleepiness increasing to coma, with dusky skin; pulse slow and weak, averaging 59; respiration 10 to 15, faint, Cheyne-Stokes in two cases; temperature up to 103°; pupils spasmodically contracted; urine sometimes containing a little albumin. The picture resembles that of muscarin poisoning and is considered by the writer to be the result of digestive disturbances. The treatment consists of hypodermatic injections of atropine sulphate for respiratory weakness, and of strophanthin as a cardiac stimulant, and administration by

mouth of a saline cathartic when the patient can be roused, repeated in a half hour. Chronic cases occur in which the child gradually becomes more somnolent and finally dies suddenly. In these the urine always contains albumin and often indican. The somnolence, slow respiration and slow, weak pulse are diagnostic; the temperature is rarely above 100.5°. In such cases strychnine nitrate, strophanthin, and atropine are given hypodermatically. Calomel, gr. $\frac{1}{3}$ every hour until effective, may be best for the bowels, followed by a saline. The chief indication is to prevent respiratory or cardiac failure.

Subcutaneous Injections of Sea Water in Athrepsia and Prematurity.—Potocki and René Quentin (*Ann. de Gyn. et d'Obst.*, Jan., 1906) describe the use of injections of sea water rendered isotonic by dilution with pure sterilized water, and injected in doses of from 10 c.c. in premature infants, to 30 to 60 c.c. in larger infants. He recites six cases, which were not selected, some of them being in very bad condition when the treatment was begun. No other medication was used while the sea-water injections were in use. The water was obtained at a depth of ten meters, at a distance from the land, and was used within three weeks of the time it was obtained. If kept too long the water loses its physiological properties. It must be carefully diluted with sterilized water, and must not be sterilized in the autoclave. The results of the injections were marvelous. The cure was complete, the improvement beginning from the first injection. The loss of weight ceased immediately; symptoms of gastritis, enteritis, icterus, athrepsia and asthenia lessened at once. Weight rapidly increased. In one case a severe gastro-enteritis was relieved at once without recourse to diet or hygienic regime. No bad effects have ever been observed, nor has intolerance shown itself, or edema from retention.

Day Nurseries and Hospitals for Children.—H. Mery (*La Presse Méd.*, Jan.) says that infant mortality among city children has been reduced one-half by supervision of their feeding at nurseries and clinics. The use of aseptic and sterilized milk has been of the greatest value in lessening tubercular lesions in the abdomen and in the tracheo-bronchial glands. Clinics for sick children should not be held in the hospital itself on account of the danger of the infant contracting one of the infectious diseases of childhood. Another needed reform is the admission of mothers with their sick infants into the hospital wards, in order that the infant may not lose the mother's milk while under treatment for conditions other than of the gastrointestinal tract. Much greater space should be allowed for the treatment of infants, so that they may not be crowded into insufficient quarters. Better opportunities should be provided for perfect isolation of all infectious diseases, as well as of broncho-pneumonia, cutaneous suppurations and severe forms of enteritis which may be transmissible. Need of more individual attention calls for more nurses and more physicians. Hospitalization should be

avoided by treatment at home, and the distribution of suitable foods in the homes, as well as by foundation of convalescent homes in the country and at the seaside.

Malignant Ovarian Tumors in Children.—J. L. Donhauser (*Albany Med. Ann.*, Jan.) records a case of ruptured necrotic ovarian cyst followed by general involvement of the abdominal viscera by a malignant neoplasm, resembling a cystic adenosarcoma in a girl of 13 years. The writer has collected from the literature seventy-two cases of malignant tumors occurring in girls between the ages of twenty-two months and fifteen years. He concludes that malignant ovarian tumors may occur in children, and in the first stages of the disease the clinical symptoms of benign and malignant tumors are identical. The tumor may be discovered accidentally or from symptoms arising from rupture of the cyst or twisting of its pedicle. While occurring in children of all ages, such growths are most common between the tenth and fourteenth years. All ovarian tumors should be regarded with suspicion because of the possibilities of malignancy. Rupture of ovarian cysts should be guarded against because of the possibility of secondary implantations in the peritoneum.

The Budde Process for Preserving Milk.—The process, says R. T. Hewlett (*Lancet*, Jan. 27), is as follows: The milk is obtained in as cleanly a condition as possible, and if it has to be kept for any time before treatment it is efficiently chilled, but usually it is treated soon after milking. A proper proportion of peroxide of hydrogen is added to the milk and the mixture is heated to from 51° to 52° C. for at least three hours. A temperature below 48° C. is not efficient and one above 55° C. should be avoided, as this tends to induce changes in the milk. With the aid of the heating, the hydrogen peroxide is completely decomposed into water and oxygen by an enzyme (catalase) present in the milk, and the oxygen at the moment of liberation being in a nascent condition acts as an efficient germicide. At the end of the process the whole of the hydrogen peroxide should have been decomposed, provided the right proportion has been added, so that no antiseptic remains, a small but inappreciable addition of water has been made to the milk, and the majority of the micro-organisms have been destroyed. The amount of hydrogen peroxide required to obtain this result is about 15 c.c. of a 3 per cent. solution per liter of milk, so that the quantity of water added to the milk amounts to about 1.5 per cent., which, on a basis of 3 per cent. of fat, would reduce the percentage of fat to 2.95 in the treated milk, a reduction in the percentage of fat of about 0.5 per cent., which may be regarded as negligible. The milk is treated in bulk and is immediately bottled. It is practically unaltered in appearance and flavor; the cream rises as usual; the acidity is not increased, and the milk will keep sweet for at least eight or ten days in hot weather. All the spore-bearing organisms tested, pathogenic and non-

pathogenic—the bacillus tuberculosis, the bacillus diphtheriæ, the bacillus acidi lactici, the bacillus typhosus, the bacillus coli, the bacillus dysenteriæ, a paratyphoid bacillus, the micrococcus pyogenes aureus and the cholera spirillum—are destroyed by the process. Sporulating forms—the bacillus anthracis, the penicillium glaucum, the bacillus subtilis, and the bacillus mycoides—are not destroyed by the process, although reduced in numbers, the inference being that the vegetative forms are destroyed but the spores are not destroyed. Although the heating *per se* may be efficient in destroying certain non-sporulating organisms, it is not so in all cases. "Buddeising" is far more effective.

Value of Dextrinized Flour in Comparison with the Pure Milk Diet and the Use of Barley.—Gaetano Finizio and Emilia Concornotti (*Ann. di Elett. Med. e Terapia Fis.*, Feb., 1906) give the conclusions at which they have arrived after feeding two healthy infants for variable periods on pure milk, and on milk with the addition of dextrinized flour, or barley, making careful analyses of the ingesta and the fecal products. They find that in both cases, one of two years and one ten months old, the cereals increased the assimilation of proteid products as well as of all the constituents of the food. As the proteids are among the most putrescible materials of the food and those most likely to generate toxic substances, the use of the cereals becomes of great value in the diet of healthy infants, and also in the treatment of gastrointestinal troubles. There was much less putrefaction with the use of cereals than with milk alone. The dextrinized flour was more valuable than the barley, especially in the younger child.

Fat Problems and Goat's Milk in Infant Feeding.—J. F. Bell (*Arch. of Ped.*, Mar.) says that the digestion of fat retards the flow and diminishes the amount of gastric juice and lowers its digestive power. The ingestion of fluid fat increases the flow of pancreatic juice and probably the activity of its fat-splitting enzyme steapsin. If the fat is not fluid at body temperature it may further interfere with the flow of gastric juice by coating the gastric mucosa, thus mechanically interfering with the secretion, and by covering curds with a layer of insoluble fat and so protecting them from the action of both gastric and pancreatic juices. If goat's milk fat more closely approximates human milk fat than the fat of cow's milk does, and if the proteid and sugar constituents are not more compatible than in cow's milk, goat's milk merits an extensive and thorough clinical trial in infant feeding.

Starch Digestion in Children Under One Year of Age.—C. G. Kerley and W. C. Campbell (*N. Y. Med. Jour.*, Jan. 27) report the results of the tests for starch in the stools of starch-fed children under one year of age. They made 166 examinations in 30 cases. Barley flour cooked one and a half hours was used. A portion of the stool was boiled and shaken; Lugol's iodine

solution was added and the blue color due to the presence of starch was looked for after filtration. Of the 30 cases, 23 showed a good starch capacity. Of these, 11 had diarrhea. A poor starch capacity was demonstrated in 7, of whom one was eight days old, and the other six had diarrhea.

Hypertrophic Stenosis of the Pylorus.—A posterior gastro-enterostomy without a loop, performed upon an infant of three months which was suffering from hypertrophic stenosis of the pylorus, is recorded by John Rogers and John Howland (*Arch. of Ped.*, Mar.) as the third successful operation of the kind reported in this country.

Trachoma in Children.—C. C. Bradley (*Med. Rec.*, Feb. 3) believes that the general use of sulphate of copper in the treatment of trachoma is not altogether harmless. To its use he attributes extreme cicatrization of the lids in chronic cases. He has found a one per cent. solution of bichloride of mercury harmless and quite as effective as sulphate of copper. Copper citrate is apparently devoid of the objectionable features of blue stone. Expression lessens the duration of the disease markedly and also the tendency to hypertrophy with consequent cicatricial contraction. General anesthesia is unnecessary in this operation. Cocaine hydrochlorate in solid form, rubbed thoroughly into the lids, permits thorough treatment and obviates the necessity for haste in operating. After the operation the writer flushes the eyes with 1:2000 formaldehyde solution and dresses them with a bandage moistened with the same, after placing borated vaseline between the lids. After six hours the eyes are flushed frequently for three days with 1:3000 formaldehyde. After the third day silver nitrate, one per cent., is used daily if there is much discharge, and frequent flushings with 1:6000 bichloride are practiced until the case is discharged.

Dermoid Tumor of the Mediastinum.—The patient of George Carpenter (*Lancet*, Feb. 3) had developed cough at the age of one year, and an attack of pneumonia four months later. At that time her chest was bulging. At the age of two she could not lie down, complained of pain in the side, was cyanosed and breathing rapidly. The right chest was absolutely dull. The breath sounds were bronchial over the apex in front and down to the spine of the scapula. Over the rest of this chest the breath sounds were diminished increasingly toward the base, and even absent at the base anteriorly. The heart was displaced toward the left and the liver downward. After removal of 13½ ounces of straw-colored opalescent fluid from the right chest this became resonant behind, but dullness persisted in front, and the x-ray showed opacity of that entire lung. Improvement was rapid. Four weeks later the child was cyanosed and moribund and died soon afterward. Autopsy showed a mass the size of a fist in front of the right lung, which it compressed. The tumor consisted of a number of cysts, mostly containing

gelatinous material, and in one were sebaceous material and short hairs.

Common Symptoms of Disease in Children.—Robert Hutchison (*Clin. Jour.*, Feb. 7) brings up a number of practical points in connection with abdominal pain in children. The first group of causes are extra-abdominal, the pain merely being referred. These include spinal caries, pleurisy, hip disease and rheumatism. Of abdominal causes the most common is intestinal colic. Gastric pain is unusual in children, as they rarely suffer from organic diseases of the stomach, but frequently from functional disturbances, and these rarely cause actual pain. Chronic appendicitis, to be diagnosed by palpation, round worms, and pain due to passage of uric acid or small stones down the ureters are not to be forgotten. In rare cases the pain is actually of gastric origin, from hyperacidity, for example. The fact that the pain begins soon after meals does not necessarily indicate that the stomach is its site, as eating may start intestinal peristalsis. Among the common causes of dysphagia the writer mentions congenital adenoids, cleft palate, mental deficiency, paralysis of the palate from diphtheria, irritability and congestion of the pharynx associated with enlarged tonsils, and simple perverseness of the child who resents the change from the bottle to solid diet.

Coincidence of Diseases.—Edmund Cautley (*Brit. Jour. Child. Dis.*, Jan.) illustrates the difficulty in diagnosis which this may occasion by reporting two cases of typhoid plus paratyphoid fever, proven by agglutination tests, one of tuberculous plus cerebrospinal meningitis proven by bacteriological examination of spinal fluid and autopsy, and one which he regards as acute anterior poliomyelitis closely following diphtheria with paralysis.

Uniform Lineal Growths of the Human Fetus.—As it is well known that the fetus grows between the third month and full term at a nearly uniform rate, and as the weight of the fetus, and consequently the volume, can be shown to be directly proportionate to the cube of the length, R. C. Roberts (*Lancet*, Feb. 3) considers it proven that the fetus grows in all three directions at nearly a uniform rate. He finds that the cube of the age of the fetus in months divided by 104 gives its weight in pounds, correct to within one ounce at the third month and absolutely correct at full term.

Infantile Scoliosis.—P. Defosses (*La Presse méd.*, Jan. 3, 1900) contends that curvature of the spine begins at a very early age, even during infancy, but that it is not usually diagnosed and treatment begun until the child is two years old or more. He believes that it is important for physicians and mothers to examine the back in young children much more often than is customary, and that thus these deformities may be discovered early and treatment be of more avail. He contends that cases discovered after the bony deformity has become marked and the muscles atrophied are never really cured, and

that treatment goes on for years with all kinds of corsets, and supports, with gymnastic exercises, etc., without avail. This treatment is unavailing because it is begun too late. Most cases that appear at the clinics are from ten to fourteen years of age. The principal characteristics of infantile scoliosis are these: it involves the dorsal region; it is shown by a marked curvature of the ribs and a costal bulging more marked than the lateral curve.

Deformities of the Chest in Children.—Theodore Fisher (*Brit. Jour. Child. Dis.*, Jan.) calls attention to the fact that at birth the shape of the chest is almost circular and respiration chiefly diaphragmatic. After describing the vertical and horizontal grooves due to rickets, the writer speaks of flattening of one side of the chest as usually caused by neglected pleural effusion. This deformity in young children, as well as the grooves due to rickets, may disappear, as is shown in some of his own cases. The "barrel chest" results from asthma as in adults, and in some cases of cardiac hypertrophy there is marked bulging of the precordia. This is often associated with adherent pericardium. Lateral curvature with its typical chest deformity may result from bad habits of sitting or from empyema. Bulging of the intercostal spaces in empyema is very rare and probably occurs only when the intercostal muscles are much weakened. An apparent bulging may be due to edema of the skin.

Mitral Stenosis in Children.—Leon d'Astros (*Rev. mens. des Malad. de l'Enf.*, Jan. 1905) states that mitral stenosis in children is rare. It may be the result of infection in early life, or may be congenital. When congenital it may result from an intrauterine infection, or be the hereditary transmission of a diathesis such as tuberculosis. The author cites a family in which the mother was affected by mitral stenosis and her children showed the same lesion. The symptoms and physical signs are the same as in the adult. The children are usually lymphatic, scrofulous or poorly developed. There are generally thoracic deformities and nervous symptoms. The condition may remain latent until puberty and symptoms show themselves at the appearance of menstruation. In other cases it gives the ordinary symptoms early in life.

Treatment and Prophylaxis of Scarlatina.—Campe-Schnarsleben (*Berl. klin. Woch.*, Dec. 25, 1905) describes the attempts made to produce a serum that would antagonize the poison of scarlet fever as antitoxin does that of diphtheria. This was difficult in the absence of positive knowledge of the germ of scarlet fever, but an attempt was made to obtain the germ in pure culture. The best tissues from which to obtain the culture seemed to be the blood and the skin, next the kidneys, while the tonsils probably contain more of the complicating streptococci. The author believes that the streptococcus is not the cause of scarlet fever, but that the presence of this germ prepares the soil for the growth of the true causative

germ. Scarlet fever is a comparatively simple disease when streptococcus septicemia does not complicate it, and the serious complications are due to the streptococcus. After obtaining an extract of the tissues mentioned, animals were inoculated with it, in order to obtain a powerful scarlet fever antitoxin. This serum was prepared at the laboratory of Marpmann, in Leipzig, and has been tested by various practitioners. Up to September, 1905, 67 cases of true scarlet fever were treated, of which 62 recovered and 5 died. Of the deaths, 2 cases in scrofulous children were complicated with typhoid, and the serum was given on the third day of the disease and had no effect. The third case was complicated by nephritis and bronchitis, and the serum was given when there were dyspnea and much albuminuria. Another had the eruption much delayed in appearance. The fifth was a young girl, who had the serum on the sixth day, and died of heart failure. The first three cases died as a result of complications, not from the use of the serum. The serum should be used only in pure, uncomplicated cases of scarlet fever, as it has no effect on the complicating streptococcus infection. In 13 of the cured cases the disease was severe, sometimes complicated by diphtheritic symptoms; 18 had albuminuria. When the serum was given at the very beginning of the disease the course of the latter was short, and the complications were few. The effect of the serum was shown in a short time after administration: the patients became less restless, headache was less, and head symptoms disappeared, temperature became lowered, and the pulse slower. In most cases convalescence was established after a few days. Pure scarlet fever is not more harmful than measles or r6theln. It is most important to use the serum as soon after diagnosis as possible, and in uncomplicated cases only. The question comes up whether this serum has a prophylactic value in persons exposed to the disease. While this is an exceedingly contagious disease, there are in all families persons who do not take it, and this complicates the experiment of immunization. The serum has been injected in about two hundred cases as a prophylactic. In a number of these instances it was noticeable that immunized children did not contract the disease, while others equally exposed and uninjected succumbed to it. This was especially so in a large tenement, in which the immunized families escaped and the others contracted the disease. In some cases there was a sort of abortive attack of fever ending in a few hours. In only two cases was true scarlet fever developed after injection with the serum. The serum was given by the mouth with the same results.

Contagious Diseases of the Scalp in Public Schools.—The question of exclusion from schools of children with favus and ringworm of the scalp is a serious problem from an educational standpoint. J. Sobel (*Med. News*, Dec. 16, 1905) believes that these children should be compelled to sit apart from the

other pupils, to keep their hats and other clothing separated, or else be excluded from the school until cured. This paper includes a discussion of the treatment of the common contagious diseases of the skin and scalp.

Cerebrospinal Meningitis.—H. A. Hare (*N. Y. Med. Jour.*, Feb. 10) reports two cases as suggesting the contagious nature of cerebrospinal meningitis. The first was seen in consultation. Six hours after the onset of severe headache the patient was unconscious, with marked meningeal symptoms, and death occurred in forty-four hours. Two days later the attending physician became ill and in eight hours was comatose and in convulsions. Death took place eight hours after development of distinct meningeal symptoms and nineteen after the onset of the illness. The first patient had visited Hartford and New London, which were then infected with cerebrospinal meningitis, four days before his illness began. A medical student who helped take care of him developed a violent tonsillitis with fever and pain throughout the body. The writer also suffered from a chill, fever, severe aching in neck, back and limbs four days after seeing the first patient, and within twelve hours of seeing the second. Diphtheria antitoxin was administered in the first case and in the case of the writer himself.

In four out of thirty cases of cerebrospinal meningitis reported by W. M. Leszynsky (*Med. Rec.*, Mar. 3) bilateral exophthalmos was a prominent symptom. This is probably due to hyperemia of the retrobulbar orbital tissues. The protrusion of the eyeballs was more pronounced than is ordinarily observed in patients with exophthalmic goiter. The writer employed the ice bag in the treatment of all cases, but regards it as of doubtful value. The hot bath at 105° for fifteen or twenty minutes several times a day was a valuable sedative and improved the general condition temporarily. Ergot gave most gratifying results in relieving pain, restlessness and delirium and improving the pulse.

Cerebrospinal Meningitis.—O. T. Osborn (*N. Y. Med. Jour.*, Feb. 17) believes that many mild cases of cerebrospinal meningitis occur, that a large majority of cases recover, and that the disease is not contagious. The treatment should consist in diminishing congestion, preventing or relieving spinal pressure and combating symptoms. The use of diphtheria antitoxin is theoretically unsound and practically a failure. Spinal puncture is not curative, and does not seem to ameliorate symptoms sufficiently often to make it a routine procedure. The sore throat should be treated with antiseptic gargles and sprays, none better than hydrogen peroxide. For conjunctivitis, boric acid solution. Calomel or a saline purge should be given at the onset. Painful joints should be wrapped in cotton and kept warm. For these and other pains morphine should be given in any dose which is necessary for relief. Bromides and chloral may be given for not more than two or three days if

pain is not severe, pulse good and vomiting absent. Ergot hypodermatically is strongly recommended to relieve pain, quiet cerebral excitement, diminish the necessity for large doses of morphine, contract the cerebral and spinal arteries, and by contracting the blood-vessels in general to increase the diminished arterial tension. The ice cap to the head and spine is considered most necessary. If the temperature is subnormal or the body surface cold, dry hot applications are useful. The general care of the patient is the same as in typhoid. Food should not be insisted upon the first few days; later it is very important. and beef juice, raw eggs and milk should be given in sufficient quantities. Alcohol is used only in small doses in emergencies; strychnine never unless ergot fails to relieve severe cardiac depression. Quinine should never be employed. When convalescence begins, give potassium or sodium iodide in small doses to aid absorption of exudates.

Significance of Cytodiagnosis and Therapeutic Value of Lumbar Puncture in Tubercular Meningitis.—Olimpio Cozzolino (*Riv. di Clin. Ped.*, Feb., 1906) states that there is no true pathognomonic sign of tubercular meningitis. Leucocytosis has been considered a sign of this affection, and the bacteriological examination of the blood may give some clue to the diagnosis, although it will not show the location of the trouble. The author has examined the blood in eleven cases of which he gives the histories. He concludes that the cytological examination of the blood in infantile tubercular meningitis gives a useful element for diagnosis. Polynucleosis is not rare in basilar meningitis in the presence in the blood of either many or few tubercle bacilli. Other means of diagnosis should be employed at the same time. The degree of pressure of the cerebrospinal fluid, the quantity, etc., are not of great diagnostic value. As to its therapeutic value, lumbar puncture may be said to rarely give any relief.

Tuberculosis of the Brain.—Roberto Alessandri (*Ann. of Surg.*, Feb.) says that the solitary tubercle is the commonest cerebral tumor in children, and especially in them the solitary tubercle is associated in about 73 per cent. of the cases with tuberculous meningitis. In adults it is relatively rarer and often single and uncomplicated. The tubercle is often situated in inaccessible regions of the brain. Few cases are operable. To allow of intervention the seat of the lesion must be definitely diagnosed. In 22 cases of cerebral tubercle collected by the writer the result of operation was favorable in 19, though in some of these the improvement was slight or absent. Of the six cases of tuberculosis of the cerebellum four died immediately; in one, death occurred in two and a-half months; in the other, in ten.

Danger of Ingestion of Bacilli of Tuberculosis Killed by Heat.—A. Calmette and M. Breton (*La Presse méd.*, Feb. 21, 1906) call attention to the fact demonstrated by them by experiments on animals that the ingestion of tubercle bacilli, even after they have

been killed by the heat of sterilization, may be very dangerous for tubercular subjects and not entirely inoffensive to the sound. The use of milk from tuberculous cows should be absolutely interdicted even after sterilization, since sterilization by heat does not destroy its noxious qualities. It is especially necessary to forbid the use of such milk by infants and those adults already affected by tuberculosis. The public health authorities should have power to forbid the sale of such milk, and all producers should have their stock carefully examined for the presence of tuberculous cattle, so as to avoid these dangers. The effects on animals of the ingestion of such milk is identical with that of daily small doses of tuberculin.

Tuberculosis in Infancy and Childhood.—The literature is reviewed by Paul Mathews (*Brit. Jour. Child. Dis.*, Mar.) to show that the majority of tuberculous infants appear to be infected from tuberculous relatives, not from the milk of tuberculous cows, even in cases where the infection may appear to have been through the alimentary system. In 25 successive autopsies upon tuberculous patients in the Newcastle Sick Children's Hospital, which he has studied, the lungs showed tuberculosis in 23 cases, only two of these entirely miliary. The bronchial lymph nodes showed macroscopic changes in 19 cases, the mesenteric in 20. The intestinal mucosa showed changes in 15 cases, in all of which there was advanced pulmonary tuberculosis. In this series the bronchial and mesenteric lymph nodes were affected with almost equal frequency. In only four cases were the mesenteric nodes involved without the bronchial, and three had tuberculosis of the bronchial but not of the mesenteric nodes. According to the writer the histories furnish no means of foretelling whether the bronchial or mesenteric nodes have been primarily affected, nor does an autopsy afford a more certain clue in the majority of cases. Of the cases in which the mesenteric nodes were affected there was a history of constant association with another tuberculous individual in 50 per cent., while they were involved in 66 per cent. of cases which were fed entirely at the breast or on proprietary foods until after the onset of symptoms. From these facts the writer argues that it is fallacious to compute the frequency of milk infection from the proportion of cases of involvement of the mesenteric nodes without attention to the history of feeding and of association with cases of tuberculosis.

Diphtheria.—E. W. Saunders (*Arch. of Ped.*, Feb.) calls attention to the tendency of physicians, since the introduction of antitoxin, to postpone interference for the relief of stenosis of the respiratory tract. Many rely almost entirely upon the injection of antitoxin. These overlook four factors of immediate danger: pseudomembrane, either attached or detached, swelling of the tissues; laryngospasm; retained secretions. The writer also insists upon the value of tracheotomy in (1) cases of unrelenting spasm of the glottis; in (2) tracheal or tracheo-

bronchial diphtheria; in (3) cases with extensive membranes in the fauces which may occlude the tube from above; in (4) cases apparently moribund.

Diphtheria.—G. Barbensi and A. Barchielli (*Riv. clin. di Ped.*, Apr., 1906) sum up the cases treated at the diphtheria pavilion of the Hospital in Florence, from July to October, 1905. These were all treated with a mixture of the serum of Sclavo-Bandi, which is bivalent, and that of Belfanti, which is antitoxic, used in equal parts. Doses of from 2,000 to 10,000 units in all were given. The antibacterial serum of Sclavo-Bandi was used also for painting and as a powder in the throat, for instillation in rhinitis, and in tracheolaryngitis by means of a Bayeux syringe. The intubation and tracheotomy tubes were also bathed in it before using them. There were 106 pharyngeal and 109 laryngeal cases, and one of diphtheritic stomatitis. The mortality was 8.7 per cent. There were 35 cases operated on for laryngeal stenosis. The results are excellent, but no better than with the use of the Behring serum.

Education in Sexual Subjects.—F. C. Valentine (*N. Y. Med. Jour.*, Feb. 10) believes that sexual physiology and hygiene need not be formally taught girls, save in the exceptional instances in which the genesic impulse is prematurely developed. Sexual physiology and hygiene should be taught every boy, when mental and sexual puberty make him capable of beneficially utilizing the knowledge. The nature and scope of instruction on sexual subjects should be regulated according to each pupil's ability to appreciate the warnings. The age at which a person may safely be instructed in sexual subjects is that age at which, in each individual case, such instruction becomes necessary for the purposes of moral and physical prophylaxis. The individuality of the parent, physician, or teacher, should be the guide to the choice of one or the other as the exponent of the facts. Educational institutions may be utilized for instruction in sexual subjects, but such instruction must be given to small groups of pupils selected because of their mental parity as nearly as may be. Textbooks on elementary hygiene should not contain chapters on sexual physiology. Those charged with imparting instruction on sexual subjects should be provided with separately-printed chapters on the physiology and hygiene of these matters. These separately-printed chapters could then be given with the greatest discretion to those pupils only whose mental development would preclude their misusing the information derived therefrom. All instruction to the laity on sexual subjects should be directed essentially to serve as a groundwork for the following ideas: *a.* Many learned men hold that antenuptial coitus is not necessary for the health of the individual; *b.* continence reduces the sexual desire; *c.* gratification of the sexual impulse before marriage degrades the moral tone and exposes to serious infection; *d.* venereal diseases are not disgraceful infections, but the result of unfortunate lack of

self-control; *e.* the greatest danger at the inception of venereal diseases is in their being maltreated by quacks; *f.* if a person is so unfortunate as to contract a venereal disease, self-preservation should cause him to immediately seek the advice of his family physician.

Pericardial Synechia with Infantile Splenic Anemia.—Gino Menabuoni (*Riv. di Clin. Ped.*, Feb., 1906) gives the history of an unusual case of tubercular pericarditis with synechia, dying of bronchopneumonia and having the anatomical lesions of splenic anemia. The baby had gastrointestinal catarrh as a result of promiscuous feeding from the age of seven months. The pericardial and pulmonary symptoms were of short duration and accompanied by fever, the child dying of this complication of diseases. There were enlarged spleen and liver, tuberculosis of the pericardium and peribronchial glands, oligocythemia and oligochromemia and a slight medullary reaction. The kidneys were the seat of acute nephritis. The intestinal intoxication combined with the tuberculosis has a marked etiological relation with the splenic lesions and splenic anemia. Malaria and syphilis, factors often considered in etiological relation with splenic anemia, were absent in this case. The tubercular lesions were a result of the blood stasis occasioned by the cardiac lesions.

Hemophilia in the Newly Born.—R. C. Larrabee (*Amer. Jour. Med. Sci.*, Mar.) puts on record a death from this cause on the fifth day after birth. There were multiple hemorrhages from the skin, mucous membranes and cord. An interesting feature is the exception to the laws of heredity shown in the history of the patient's family. In this there had occurred 15 known cases of hemophilia, of which 6 were females. Of these 15 cases, 10 inherited the disease through a male parent. These figures do not include 7 cases of slight severity, or those with incomplete histories.

Chlorosis.—This disease is known to occur most frequently in females, especially blondes, between the ages of puberty and adolescence. J. H. Barach (*N. Y. Med. Jour.*, Mar. 24) reports a typical case in a boy of 10 years, with no definite etiology.

Habitual Constipation in Children.—Luigi Concetti (*Riv. di Clin. Ped.*, Mar., 1906) states that constipation is a frequent trouble of babies otherwise well, necessitating the use of enemata and purgatives. Finally there comes on a paretic condition of the intestine, especially if injections are habitually used; pain, colic and local catarrh ensue, and the child enters on a condition of autointoxication which ends in anemia, poor development, rachitis, nervous disturbances and sometimes in death. The causes must be ascertained and removed in order to cure the patient. The author divides the forms of constipation into three groups: alimentary, functional, and anatomical. The alimentary form is accompanied by scanty urine, little increase

in weight, and sucking of the fingers as if hungry, while the quantity of food taken is small, either on account of difficult nursing or the small amount of milk produced by the mother. The child should be weighed before and after nursing, to establish the diagnosis. The remedy is changing the nurse or adding an artificial food. When the urine is abundant we may suspect a deficiency in quality of the milk, and a chemical analysis of it should be made. The mother must be better fed, or mixed feeding resorted to. In artificial feeding with any substance that must be diluted the same symptoms may result from a deficiency of cream. The remedy is to add a cereal diastase and cream to the food. When there is vomiting there may be malnutrition from lack of food. The child must be laid down on the right side after nursing; if too much milk is taken and then some rejected, the amount nursed must be lessened. Vomiting may result from too rich milk, when the mother's diet must be reduced in richness and much water drunk, with exercise. Changing the nurse may give good results when there is an idiosyncrasy between child and nurse. The severest forms depend on pyloric stenosis, when the movements of the stomach may be seen through the abdominal walls. The stricture may be organic or spasmodic from gastric irritation. If spasmodic, a change of food, and gastric lavage will remedy it. Older children also have habitual constipation when the food has too little coarse residue. The use of green vegetables, butter, oatmeal, and fruits is beneficial. In functional constipation we have a lessening of functional activity of the muscular coat, either from atrophy of the muscle or poor nervous innervation, local or general. Such a condition will result from any inflammation of the intestines or peritoneum. Here food must be so changed as to stimulate the intestine; the digestive juices must be increased by addition of enzymes; massage and electricity may be used and cold packs over the abdomen at night are useful. Rhubarb, senna and nuxvomica are also serviceable. When there are pale, hard, fetid feces, the liver must be stimulated by massage, and by calomel and Carlsbad salts in small doses. Cerebral diseases also produce constipation. The child must be educated to a regular habit of defecation, and general nervous treatment, with massage, should be used. Anatomical constipation occurs when there is a congenital malformation of any part of the intestine, a stricture, tumor, hernia, diverticulum, etc.; when there are rectal fissures, from resistance of the child from fear of pain; when there is excessive length of the intestine, or excessive size, or flexures, or angles of the colon, or an aplasia of the muscular walls of the intestine. These deformities give the most difficult forms of constipation to treat, and surgery may have to be resorted to for relief. Whatever the cause of the trouble, after eliminating this factor, palliative treatment to meet the indications must be employed. Injections should be used only occasionally, with the addition of glycerin or soap, when scybala have to

be softened and removed mechanically. Proper stimulants to the intestine must be used instead.

Anemia of Infancy.—A. G. Petrone (*Gazetta Med. di Roma*, Mar. 15, 1906) says that anemia is frequent in infancy on account of the numerous conditions that may produce it which exist in the baby, and the lack of resistance of the corpuscles and the hematopoietic organs to morbid agents. No rational classification of anemic conditions in the child is possible except with reference to the hematology. Starting with the conception that the essential symptom of anemia is oligochromemia dependant upon lowering of the globular resistance, and that at times there is oligocythemia, he divides the anemias into two groups: pure anemia and complicated anemia. Of uncomplicated anemias there are three types, chlorotic, simple and pernicious. In the chlorotic type the oligochromemia is produced by diminution of the globular resistance without the number of the red globules being lowered. There is an insufficiency of the amount of iron necessary for the formation of hemoglobin. This insufficiency may be congenital, depending on the scarcity of the reserve iron which the infantile organism takes from the mother, which may arise from any of the causes which lessen nutrition in the mother, such as poor feeding, or there may be a premature exhaustion of the reserve, or the exaggeration of hemolysis in the few days after birth. Simple anemia shows an oligochromemia produced either by oligocythemia or diminution of the number of red corpuscles with lessened globular resistance at the same time. In babies, more than in adults, there is polychromatophilia and anisocytosis, with appearance of normoblasts in the circulation. There are many causes of simple anemia which act by consumption of the blood, with diminution of production. The most frequent are disturbances of the digestive tube, deficient and improper feeding, poor hygiene, hereditary syphilis, tuberculosis, intestinal worms, sepsis, exanthemata, etc. Pernicious anemia is characterized by oligocythemia of high degree, intense oligochromemia, increased globular resistance, presence of megaloblasts in the circulation, nucleated hematæ, anisocytosis, poikilocytosis, and marked polychromatophylia. All the ordinary causes of anemia when acting in a marked degree may produce the pernicious variety. Causes aside from these are bothriocephalus latus, ankylostomum duodenale, hemorrhage, malignant tumors, malaria, syphilis, sepsis, and intestinal autointoxication. The complicated anemias are characterized by various types of hematology according to their etiology. The most important are mixed pseudoleukemia, and the myelogenous form, splenomegaly with leucopenia, and splenomegaly with lymphocytosis.

Teaching Deaf Children to Hear.—G. Hudson-Makuen (*N. Y. Med. Jour.*, Mar. 17) quotes Bezold as claiming that more than half of all deaf-mutism is acquired during the first and second years. The child simply fails to develop what hearing power is

present. The hearing may be greatly improved by the systematic use of oral gymnastics. The speaking voice used in close approximation to the ear is the most effective form of such gymnastics. This may be preceded, however, by repeated piano playing or the use of any other such sound of which the child gives any signs of appreciation. The training of speech should be carried on simultaneously with the hearing exercises. Each helps the other.

Mongolian Idiocy.—J. Comby (*Arch. de Méd. des Enfants*, Apr., 1906) defines Mongolism in infants as a peculiar form of congenital idiocy in which the appearance of the child is distinctly Asiatic. It is often mistaken for myxedema and treated as such. It is not very rare in early infancy, but the children have little endurance and die early of congenital heart lesions or of intercurrent diseases. The principal etiological factor is the poor condition of the parents, especially the mother, at the time of conception and during the pregnancy. This condition is due to a nondevelopment of the cerebrum of the child: the convolutions are flattened and the fissures fewer and less deep than normal. There is less development of the nerve cells, the higher grade of nervous elements. The head is round and flat, the eyes small and oblique, the nose flat, the mouth open and tongue large and fissured. The fontanelle is larger than normal, the teeth arrive late, and all the bodily development is slow. There are frequently nasal obstructions and spasms of the glottis. The skin is dry and yellow, and there are subcutaneous fatty masses in various locations. Hands and feet are large and short. Movements are quick and joints loose. Intellectually they are poorly developed; they recognize the surroundings, but talk badly; they are susceptible to music and learn it easily; mathematics are impossible to them, and they can learn only the simplest manual trades. Instinct of imitation is well developed. The condition is incurable. It may be diagnosed from myxedema by the more active movements, different appearance of the skin, and lack of the calm and apathy of the myxedematous child. Thyroid medication has no effect on the Mongolian idiot, while it benefits the subject of myxedema. The only treatment of any value is such as will aid in the physical and mental development and education of the child.

Multiple Polypi of the Gastrointestinal Tract.—This most unusual case is reported by David McM. Officer (*Inter. Med. Jour.*, Mar. 20). Clinically the tumors manifested their presence by causing repeated attacks of intussusception. The patient, a boy of 9 years, had had attacks of abdominal pain and vomiting, lasting from a few hours to a day during the past year. At first they occurred about once a week, recently daily. In the severe attacks a tumor appeared in the left subcostal region. Exploratory laparotomy showed nothing. The attacks continued, but were always relieved by washing out the bowel. Fifteen months after the first admission to the hospital he was

admitted a third time. An enema failed to give relief and the intussusception was reduced by laparotomy. Death soon followed. The autopsy showed that the whole gastrointestinal tract contained sessile and pedunculated adenomata. There were forty-one altogether, the largest being in the stomach near the pylorus. Speaking of tumors of this type, the writer says that children affected with adenomata of the rectum are usually pale, with irregularity of the bowels, constipation alternating with diarrhea, sometimes colic, and a discharge of mucus. If the polypus is low down it may be extruded during defecation or may leave its mark on the stool. Repeated small hemorrhages during, or more often just after movements, of the bowels is a characteristic symptom. Sessile tumors may exist for some time without bleeding, and so may the pedunculated if situated above the sphincters.

Congenital Luxation of the Head of the Radius.—Reporting two instances of this condition and reviewing a total of 51 cases, W. E. Blodgett (*Phys. and Surg.*, Mar.) says that nearly two-thirds of the cases of congenital luxation of the head of the radius are males. The lesion is equally common on the right and left sides. The commonest direction of luxation is backward; forward displacements are nearly as common; outward occur only once in eight. In nearly all of the combined cases, mobility is more or less restricted; but in half the outward luxations it is free. Supination is the motion most often limited, extension next in frequency. In backward luxations flexion is the motion most often free, while in forward dislocations extension is such. Elongation of the proximal end of the radius is present in three-quarters of the cases, and is about equally frequent whatever the direction of displacement. Bone fusion of the upper parts of the radius and ulna occurs in one-third of the cases. In all these there is little or no rotary motion and the forearm is pronated or semipronated. In nearly half the cases there is some other deformity, most often partial deficiency of ulna or radius. Congenital luxation of the head of the radius is very rare, and the writer considers the congenital character of some of the 51 reported cases as open to doubt. The factors to be considered in etiology are the embryology of the elbow, congenital syphilis, heredity, and the causes of congenital dislocations in general. Excision of the head of the radius is indicated by considerable restriction of flexion or extension in uncomplicated cases; is doubtful in cases with only rotary motion restricted; and is probably contraindicated in cases with practically free flexion and extension but permanent pronation and bone fusion.

Tuberculous Meningitis.—W. H. Whitcombe-Brown (*Lancet*, Mar. 24) reports a cure by inunctions of mercurial ointment of what he considered to be a case of tuberculous meningitis. The diagnosis was made upon purely symptomatic grounds, as neither lumbar puncture nor tuberculin injection was employed to verify it.

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